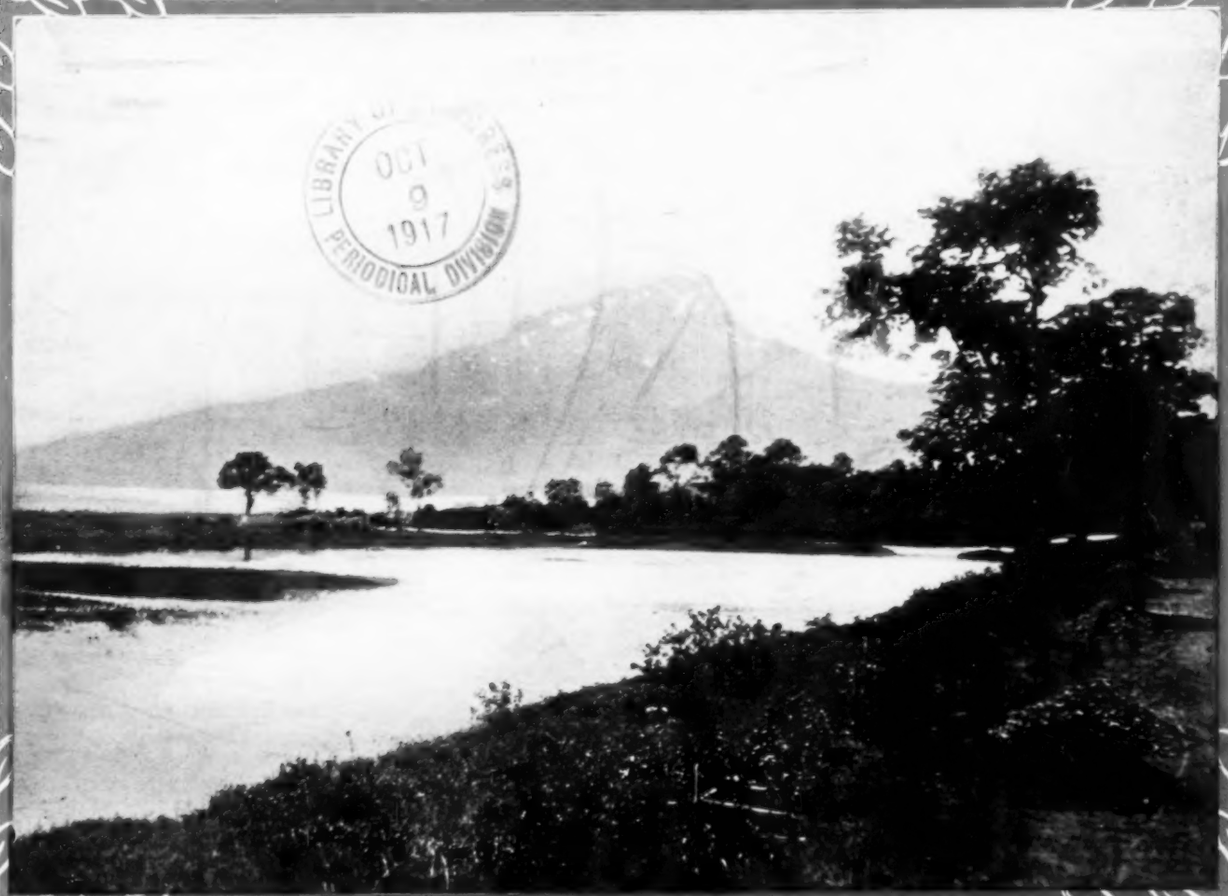
OCT -8 1917

THE RUBBER AGE AND TIRE NEWS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THE RUBBER AGE AND TIRE NEWS

SEPTEMBER 25, 1917 VOL. 2. NO. 1

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THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*

120 WEST 32D STREET NEW YORK

Room 308-310 Evening Star Building, Washington, D. C.

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OCT -8 1917

THE
RUBBER AGE
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Preparing Rubber for Insulating Wire and Cables

All kinds of crude rubber contain more or less foreign matter which usually makes it necessary to wash and dry them before they can be compounded and manufactured.

The washing and drying of crude rubber for manufacturing purposes are comparatively simple operations, which none the less have considerable bearing upon the quality of the finished product. Prolonged washing, for instance, will destroy the "nerve" of rubber, while improper drying results in much trouble in the mixing and often makes the finished product porous and useless.

SOFTENING CRUDE RUBBER IN SOAKING TANKS

Washing crude rubber for use in cable and wire insulations is probably simpler than in many other lines of rubber manufacture for the reason that cable makers use only the better qualities of the commodity, which contain less foreign matter than lower grades and are therefore easier to wash.

Most of the crude rubber used in wire and cable factories comes to the manufacturer in hams or pelles, or in sheets packed in bags, or in wooden cases. The manufacturer opens the parcels and weighs and records their contents, which he stores in separate lots in bins. The store room should be dark, dry and cool. A cement floor is best and should preferably be built with channels to take care of the water that drops from the rubber, which usually "sweats."

Softening

Crude rubber, in the state in which it comes to the factory, is hard and intractable, and has to be softened before it can be fed between the rolls of the washing mill without danger of destroying the machine. Therefore, the first step in preparing the rubber is to soften it. This is done by placing it in metal or wooden tanks or troughs partially filled with water.

These softening tanks or troughs are usually large enough to hold all the crude rubber the factory will use for a day's work. Their shape and style vary with the ideas of the manufacturer, but they are always provided with overflow and emptying outlets, and with some method for heating their contents. Steam jets or pipe coils are usually used to heat the water and facilitate the softening of the rubber. The overflow and the emptying outlets are protected against clogging by screens.

The water should never be heated to more than 122 deg. F., which is all that is necessary to soften the rubber in the time allowed for the operation. The tank should be thoroughly cleaned and the water removed each day.

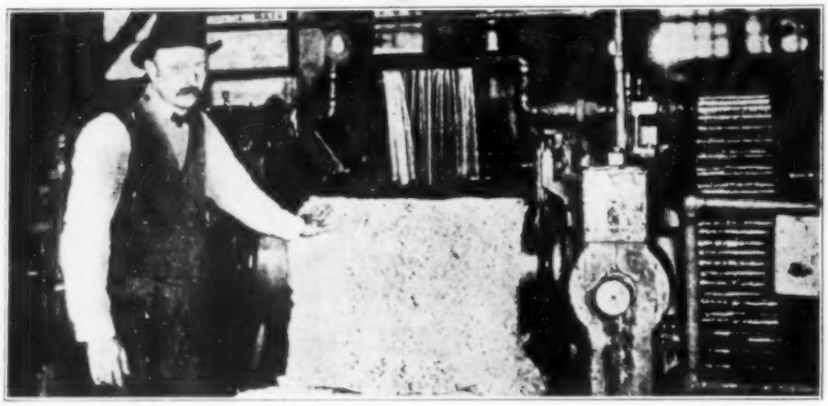
Pelles and hams of crude rubber are cut up with knives or special machinery, and sheets and biscuits of plantation rubber are separated as far as possible before being thrown into the softening tank.

Sudden changes of temperature are injurious to crude rubber and in cold weather, when frozen, it should never be thrown directly into hot water. The softening tank should be filled with cold water, and heat should not be introduced until all the rubber has been placed in the tank.

Washing

Crude rubber for insulating purposes is usually washed in ordinary washing mills, which consist of two rolls arranged horizontally, side by side, in a powerful frame. These rolls have corrugated surfaces and are chambered for heating and cooling by steam and water. The distance between the rolls is governed by adjusting screws arranged on the front of the mill frame. This adjustment is designed so that the rolls cannot touch and damage each other. A pipe with numerous holes in it is arranged above the interval between the rolls and from these water can be run onto the rubber as it passes between them. This water, the temperature of which can be regulated, should never be hotter than 122 deg. F. Bits of wood, bark, sand and similar foreign matter found in crude rubber are freed and carried away by the water when the rubber is torn by the gripping action of the rolls revolving inwardly at different speeds.

If prolonged, the action of the washing mill is injurious to rubber. From five to ten minutes' washing is all that is required to clean good Para and plantation sorts such as are used for insulating purposes. Under favorable conditions, a skilled operator



RUBBER IS WASHED ON ROLLS

can wash from 600 to 900 pounds of crude rubber a day.

Drying

After washing, rubber is sheeted by passing it through the rolls of the washer or of a mill reserved for this purpose. The sheets are made as thin as possible to facilitate drying, but must not be made too thin to be handled easily without breaking apart. For the latter reason the degree of thinness permissible varies with the quality of the rubber and the method of drying it.

There are several methods of drying crude rubber, but only two are in general use: air drying, with or without artificial heat or draft, and drying in a vacuum. Opinions vary as to which of these methods is better, but both air and vacuum-drying are suitable for all kinds of crude rubber.

Air-drying, when properly handled, always gives excellent results, but it is not as rapid as the vacuum process and requires more space and the carrying of a larger stock of crude rubber than the latter does. For this reason, vacuum driers are especially suitable for small concerns where lack of capital does not permit the carrying of a large stock of crude rubber.

Air-Drying

Air-drying is not always carried out as it should be. In the first place, a special room should be devoted to it. This room should be heated, well ventilated and dark. Daylight combined with air, dampness and comparatively high temperatures accelerate oxidization. Air and heat are necessary, but daylight is not.

Air-drying should be slow, never forced, and no more heat should be used than strictly necessary to keep the air dry enough to absorb the moisture from the rubber.

As a general rule, heat is only necessary in the winter time and in wet weather. The object in air-drying is to send dry air over the surface of the rubber and to remove this air as soon as it has become saturated with moisture.

SLITTING RUBBER ON MILL ROLLS

Air should not be drawn from the inside of the factory, but from the open, for it is important to have it as free from dust as possible. Most plants have special arrangements to keep dust out of their rubber drying-room. Air driers without any artificial ventilation produce excellent results, but blowers are advisable where it is desired to accelerate drying.

Some manufacturers believe it important to remove all superficial water and dampness from washed rubber as rapidly as possible and for this reason they accelerate drying. Others, on the contrary, do not believe in high temperatures and powerful blowing which, while rapidly removing surface dampness, harden the outside of the rubber and make it more difficult to get all the dampness out of the inside of it.

It is true that dampness helps oxidization but, as long as the rubber is not exposed to daylight, oxidization due to moisture is not dangerous.

When no artificial ventilation is used, it takes from three to five weeks —rarely more than six weeks—to thoroughly dry properly sheeted rubber.

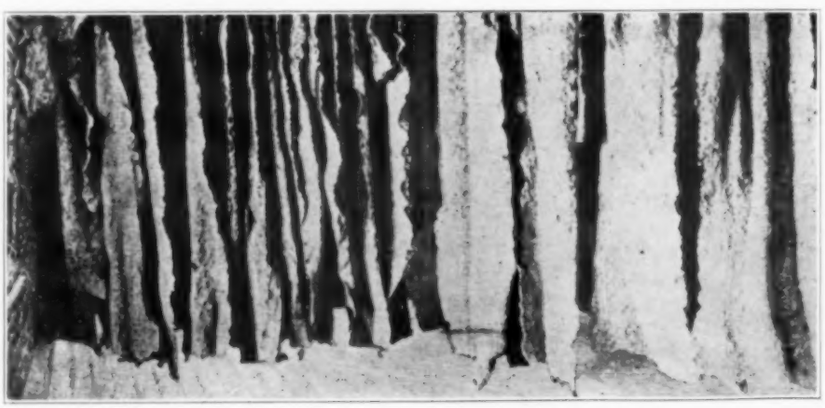
When rubber is thoroughly dry it should be removed from the drying room and stored in a dark, dry, cool place. The sheets can be laid on top of each other without danger of their sticking together at normal temperatures.

Breaking Down

Dry rubber is hard and tough, and before it can be mixed with other materials it must be "broken down" or masticated at a comparatively high temperature to make it soft and plastic.

This is done on ordinary mixing rolls which are chambered for heating and cooling with steam and water. The rolls are warmed at the beginning of the work and then have to be cooled by water circulation because the friction between them and the rubber is so great that it soon would generate enough heat to burn the rubber.

In regulating the temperature of the rolls neither steam nor water

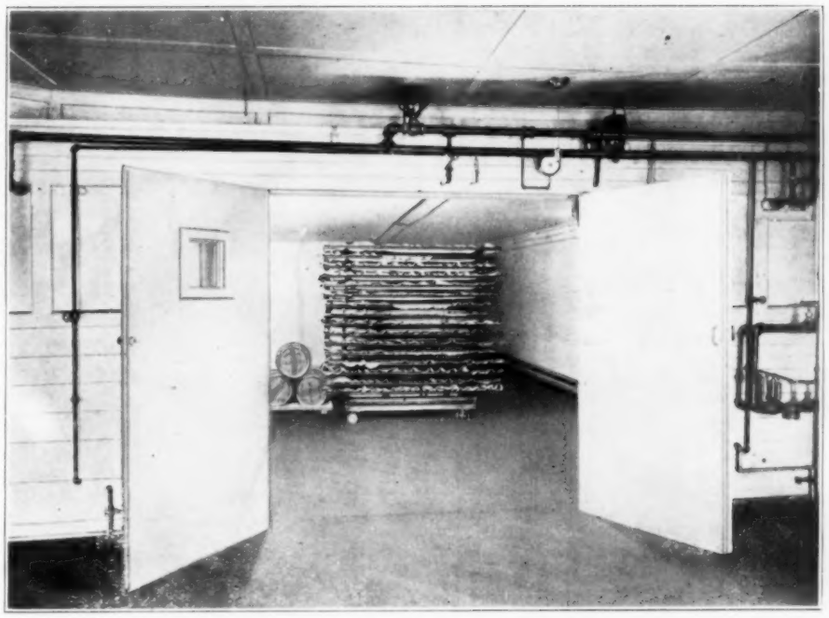


AIR-DRYING RUBBER SHEETS

should be used at high pressures which soon would destroy the tightness of stuffing boxes and other connections.

In some factories it is the practice to " break down " and mix on the same mill in one continuous operation. When possible, however, it is best to use separate mills as " breaking down " is best performed at roll temperatures that are too high for mixing and it takes some time to cool off rolls, especially large ones.

Where the equipment does not permit breaking down and mixing on different mills, the best solution is to break down at one time sufficient crude rubber for several days' work. The refined rubber is then powdered with talc and wrapped in cotton sheeting, in which it can be kept for quite a time without hardening.



DRYING RUBBER SHEETS—HUNTER DRY KILN PROCESS

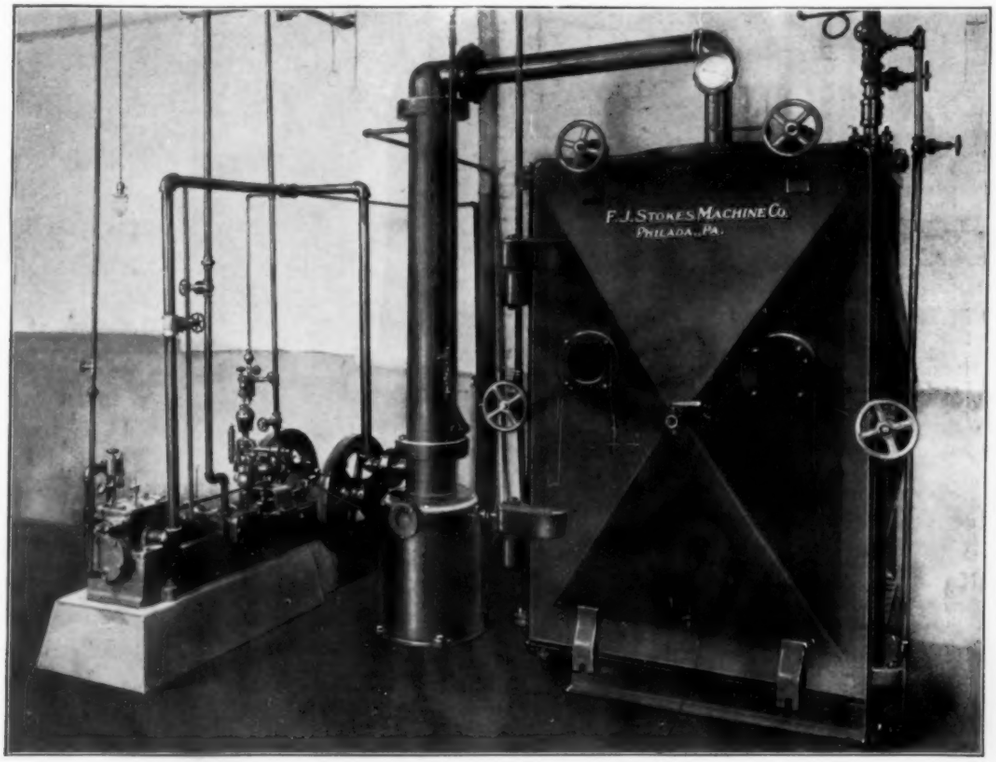
Mixing

Mixing has for its object the incorporation of various compounding materials into crude rubber. Like all other operations concerning crude rubber it should be performed as rapidly and at as low a temperature as possible.

For mixing, the more slowly running roll of the mill is warmed more than the other. A given weight of refined rubber is placed on the rolls and warmed up until soft and plastic.

If reclaimed rubber is included in the batch, it is placed on the rolls at the same time with the crude sort and the whole worked into a homogenous mass before the other compounding materials are added. Ozokerite, paraffine and similar materials are worked into the rubber prior to working in the dry ingredients.

The operation of warming up the crude rubber and working the reclaimed and the waxes into it can be accelerated by cutting the stock as it follows the front roll, folding it and feeding it between the rolls to be formed again into a sheet. This insures even mixture, but is not advisable while dry materials are being worked into the mass. When this is being done, the mill man should devote his attention to controlling the temperature of the rolls and gathering up the dry ingredients that are not caught up by the rubber and fall in the pan beneath the mill. In doing this, the millman uses a hard brush and shovel, gathering up the waste from time to time and throwing it onto the rolls.



A VACUUM SHELF DRYER

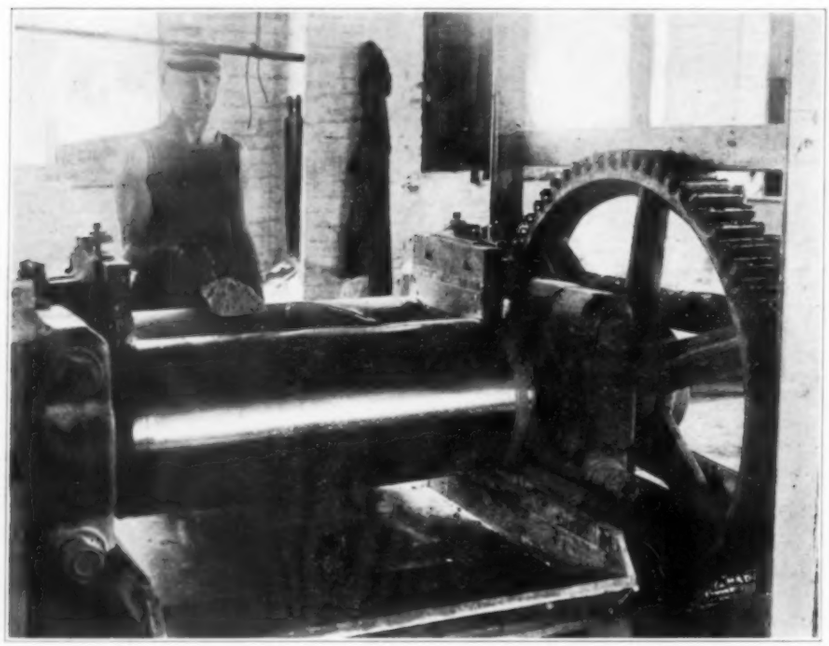
After the dry materials are fairly well taken up by the mass, the sheet can again be slit and folded on the rolls, but not too often. The whole mixing operation for wire and cable insulating stock should not last more than 45 minutes.

When perfectly mixed the stock is removed from the rolls, powdered with talc and placed on cooling tables.

Calendering

The mixed stock is sheeted by being run through calenders, which consist of from two to five rolls held horizontally, one on top of the other, in a heavy frame.

Most of the calenders used in wire and cable factories are of the three-roll type, in which the top and bottom rolls are adjustable.



MIXING: ADDING DRY INGREDIENTS

Sheeting is performed at even motion, that is to say with all the rolls of the calendar running at the same rate of speed. For frictioning the lower roll of the calender is geared to run slower than the two others. The rolls of these calenders are crowned to compensate for warping caused by the pressure between them.

It is not always practicable to sheet stock immediately after mixing, but it should never be allowed to rest long enough to get hard and tough.

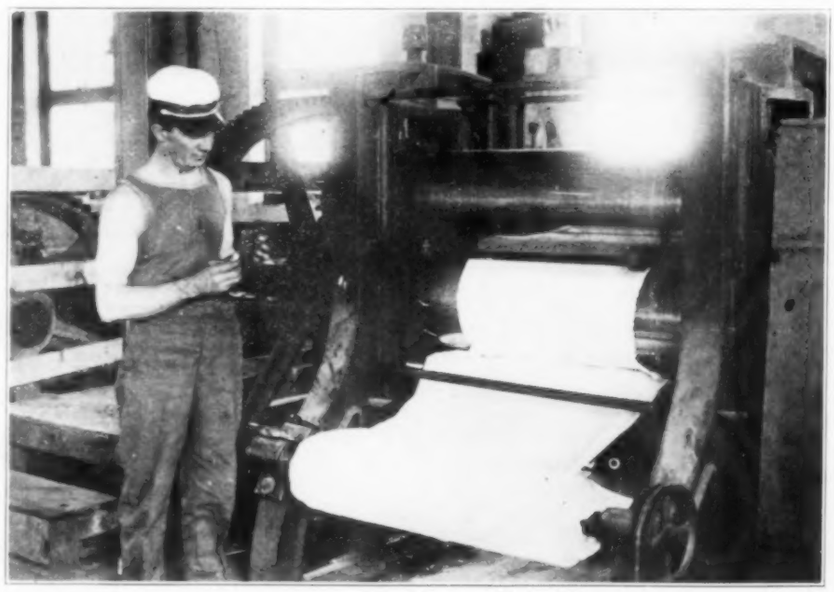
Before calendering, it is customary to warm up the stock on mill rolls similar to those used for breaking down and mixing. The two upper rolls of the calender are warmed to about the same temperature, which varies with the stock to be sheeted. The bottom roll is kept as cool as possible by running cold water through its chambers.

The width of the sheet to be produced is governed by two adjustable guides arranged on either side of the feeding table, which is on a level with the top of the middle roll.

The stock is cut into small pieces which are fed endwise, side by side, between the top roll and the middle roll of the calender.

Calenders are usually geared for two speeds, the slower of which is used for starting, so that an even sheet can be formed on the rolls. The high speed is thrown in when the work is under way. For insulating, the thickness of the sheets should not vary more than 0.003 in. throughout their length and width.

The boss calender man insures this even thickness by judicious control of the temperature of the rolls and of their adjustment with relation to one another. To verify his work, from time to time, he cuts a small sample from the rubber sheet and gauge it with a micrometer.



SHEETING AND GAUGING COMPOUNDED STOCK

In cable and wire insulating factories the windup is usually separate from the calender and is provided with a grooved spreader rod which takes out all folds and creases that may occur in the wrapping fabric with which the stock is covered as it leaves the calender. Sheets are run very long, the only limitation to their length being the weight of the roll they form with their wrapping.

Two men are required to work this type of wind-up. They use one hand to wind, the other to guide the fabric and prevent folds.

Tinfoil for wrapping is in thin sheets of suitable width. It is in a roll arranged on a let-off rack and is run on to the wind up together with the sheeted stock in the manner that is usual in wrapping rubber sheets with fabric as they come out of the calender.

For certain stocks it is customary to use tinfoil instead of cotton sheeting for wrapping calendered stock.

A ply of pure rubber is sometimes applied as a first layer of insulation on submarine cables. The sheet of pure gum for this purpose is usually run from the calender onto previously sheeted outside stock.

Where tubing machines are used for insulating the rubber stock is not sheeted on calenders, it being sufficient to cut it into strips suitable for feeding into the tubing machines. After cutting and until fed into tubing machines, these strips of stock are kept between the leaves of books made of cotton sheeting.

After being calendered and wrapped in fabric or tinfoil, rubber stock for insulating purposes can be stored for a long time without deteriorating; in fact, it is best to allow it to " age " for some time before using it. The object is to allow it to recover the " nerve " and strength lost in milling and calendering.

Rubber Section of American Chemical Society Meets in Boston

The Rubber Section of the American Chemical Society held its annual fall meeting at the Hotel Lennox in Boston on Sept. 12.

The meeting was called to order by the chairman, Dr. Lothar E. Weber of Boston, Mass. Dr. Weber reported on the work of the section during the past year, explaining the formation of the Section and the regulations of the American Chemical Society, governing its sections.

Dr. Frederic Dannerth of the Rubber Trade Laboratory, suggested that an executive committee be formed to assist the chairman and secretary of the Section. On motion the Section authorized the formation of such a committee with instructions to the officers to appoint it after due consideration.

The regular program of the meeting was then taken up. In the absence of H. S. Upton, his paper was read by John B. Tuttle of the Bureau of Standards. This paper described a volumetric method for the determination of free sulphur in insulated wire, or titration of free sulphur in soft rubber.

This method is especially of value in the analysis of insulated wire and cable. The procedure is as follows:

Extract a two gram sample of the rubber compound with acetone into a 300 cc. Erlenmeyer flask until the free sulphur has been removed. Evaporate the acetone until little remains. Complete the drying in an oven at 100 degrees C. The sulphur is oxidized to theosulphate and sulphide with 25 to 50 cc. of alcoholic potash solution, by boiling gently for one hour, using a small glass funnel placed in the neck of the flask for a condenser. Cool the flask, wash and remove funnel from the flask. Add 25 to 50 cc. of ammonium zinc chloride solution and just bring to boiling. Cool with cold water. Acidify with glacial acetic acid for three cc. in excess; dilute to 200 cc. and titrate with standard iodine solution. This gives the sulphur present as theosulphate. The precipitate of zinc sulphide is not acted upon by the acetic acid.

Add ammonium hydrate to destroy the acidity and the excess of iodine. Add hydrochlorate acid to acidity for five cc. in excess. This dissolves the zinc sulphide and liberates hydrogen sulphide. Titrate the hydrogen sulphide with standard iodine solution and calculate to sulphur. The free sulphur is equal to the sum of the theosulphate and sulphide determined.

The next paper on the program related to the Bureau of Standards' method for the direct determination of rubber, reported by J. B. Tuttle and Louis Yurow, briefed as follows:

Preliminary extractions of a two gram sample are made according to the usual methods of the Bureau of Standards' Circular 38, to determine the amount of acetone, chloroform, and alcoholic potash extracts. These extractions will prove the presence or absence of mineral rubbers and oil substitutes. In the absence of both, proceed as below. If mineral rubbers are present, make a chloroform extraction; if oil substitutes, an alcoholic potash extraction; and if both are present make both extractions. In every case, make these extractions after the acetone extraction, and before the sample is allowed to swell in chloroform.

Take 0.500 to 1.000 gr. of the finely ground sample (call this weight W), and extract with acetone for eight hours. If necessary make other extractions as above. Dry the residue in hydrogen (or other inert gas) for two hours at 100 deg. C. Place the sample in 50 to 75 cc. of chloroform, and allow it to swell. Pass into this solution until the green color which is formed persists for thirty minutes, the gases formed by heating arsenic trioxide and nitric acid of specific gravity 1.30. To avoid contamination it is important that no rubber connections be used. Immerse the flask containing the rubber in cold water during the nitration. Allow the solution to stand overnight; the next day, filter off the nitrosite through a Gooch crucible and wash with small quantities of chloroform.

Remove the acid gases and chloroform from the flask by means of a gentle current of air. Evaporate the filtrate to dryness. Dissolve the nitrosite remaining in the flask, on the Gooch crucible, and in the residue from the filtrate, in acetone, and filter the solution through asbestos into the weight burette. The total volume should be about 100 cc. Allow this solution to stand a short time so as to permit any sediment which may form to settle out in the bottom of the weight burette. Weigh the burette before and after filling, calling the difference N. Draw off about 25 cc. into a small Erlenmeyer flask, reweigh the burette and call the difference O. Evaporate the portion drawn off to a small volume, transfer to a porcelain boat (about 14 cm. long, and 1 cm. wide), which has been filled with alundum, rinsing the flask with acetone. (It is best to make this transfer in small portions, drying the boat and contents for a few minutes between each addition.) After the final washing and drying, add 1 or 2 cc. of 1 per cent solution of ammonia in distilled water, and dry in an inert gas for one hour, at 90 deg. C. Repeat with a second portion of ammonia and dry as before. By this means, all of the organic solvent will be removed.

Place the boat in the furnace, and proceed with the combustion as usual. The furnace should be carefully tested before using. Pass the products of combustion through U-tubes or other satisfactory absorption tubes, placed in the following order: a, b, c; potassium bichromate-sulphuric acid, d; powdered zinc, 20-mesh, e, f; soda-lime and calcium chloride, g; potassium bichromate-sulphuric acid, h; dilute palladium chloride solution. (Very little palladium chloride is needed. We use about one drop of 10 per cent solution in 10 cc. of distilled water.) Weigh 4, f, and g before and after each combustion; refill e and g frequently from the same solution so that the gases which enter e and those that leave g will have the same moisture content. The palladium chloride serves to detect the presence of carbon monoxide; if there is any blackening, it shows incomplete oxidation. In this event, discard the results and repeat the determination.

The carbon dioxide will equal the algebraic sum of the differences in tubes e, f, and g. Call this P. The factor for calculating from carbon dioxide to rubber hydro-carbons is 0.309. The formula is therefore as follows:

$$P \times 0.309 \times \frac{N}{O} \times \frac{100}{W} = \text{Per cent}$$

rubber hydrocarbons.

Correct this figure for whatever extractions were made previous to nitration.

The increase in gravity during the vulcanization of rubber was then discussed by Dr. L. E. Weber.

The discussion of a symposium on the best methods for the determination of free and total sulphur, which followed, covered a résumé of the various methods published in recent years. Their advantages and disadvantages were fully received by the members present.

In discussing the use of accelerators in the vulcanization of rubber, one of the most important points raised was that of the danger of poisoning through their use in rubber compounding. It was agreed that the companies having a highly organized research laboratory were well aware of the poisonous nature of many of these accelerators, but there still remain many rubber companies which, even if they are not using accelerators now, will probably do so in the near

future. These small companies, not having the advantages of the larger ones, will probably use accelerators without knowing what precautions should be adopted. The rubber section, therefore, decided to form a Research Committee, whose duty it shall be to investigate as far as possible all of the accelerators now in use, or which may be used, and present a report to the section, advising just what precautions must be adopted in their use, to properly protect the workman in the factory.

The status of the rubber chemist in the national service was presented by H. C. Pearson, who opened the discussion, and was followed by Dr. D. Spence, chairman of the Sub-Committee on Rubber and Allied Products of the National Research Council.

Contributions to the three last papers were also offered by Messrs. D. Spence, C. R. Boggs, L. D. Plumb, D. S. Cranor, R. B. Earle, L. E. Weber, J. B. Tuttle, R. S. Posmontier, J. P. Millwood, F. Dannerth, A. T. Saunders, F. J. Maywald, and others.

It was announced that the next meeting of the section will be held in September, 1918, at Cleveland, O., the exact date to be announced later.

The Rubber Section is becoming of increasing importance in the technical work it is doing and the growing interest that the rubber chemists are taking in it is a gratifying indication of the value to the industry of the interchange of ideas.

Among those in attendance were:

Name	*Address*	*Firm*
F. W. Willard	Chicago, Ill.	Western Electric Co.
G. W. Warren	Boston, Mass.	Revere Rubber Co.
R. E. Drake	Brockton, Mass.	Avon Sole Co.
Henry C. Pearson	New York City	India Rubber World.
A. H. Nuekolls	Chicago, Ill.	Underwriters' Laboratories.
D. F. Cranor	Conshohocken, Pa.	Lee Tire & Rubber Co.
G. S. J. Dalton	Mansfield, Ohio	Mansfield Tire & Rubber Co.
Frederie Dannerth	Newark, N. J.	Rubber Trade Laboratory
C. R. Boggs	Boston, Mass.	Simplex Wire & Cable Co.
G. T. Cottle	Newark, N. J.	A. A. Wire Co.
I. W. Smith	New York City	Bishop Gutta Percha & Rubber Co.
L. C. Shaw	Brockton, Mass.	Avon Sole Co.
H. B. Kippel	Naugatuck, Conn.	Rubber Regenerating Co.
E. F. Poole	Wallingford, Conn.	N. Y. Insulated Wire Co.
E. M. Follansbee	Somerville, Mass.	Simplex Wire & Cable Co.
A. E. Ellis	600 W. 59th St., New York	Interborough R. T. Co.
S. Collier	Salem, Mass.	Boston Belting Co.
Geo. Bauman	Wilkesbarre, Pa.	Hazard Mfg. Co.
F. J. Deemer	Wilkesbarre, Pa.	Hazard Mfg. Co.
C. W. Walker	Worcester, Mass.	American Steel & Wire Co.
C. J. Howell	Butler, N. J.	Pequanoc Rubber Co.
G. H. Ellinwood	Boston, Mass.	Boston Belting Co.
W. P. Bradley	Providence, R. I.	Revere Rubber Co.
I. V. Stone	Providence, R. I.	Revere Rubber Co.
W. D. Pardoe	Trenton, N. J.	Thermoid Rubber Co.
C. R. Rubidge	Toronto, Canada	Gutta Percha & Rubber Co.
L. J. Plumb	New York City	U. S. Rubber Reclaiming Co.
Webster Norris	Bridgeport, Conn.	Polack Tire & Rubber Co.
J. H. Mason	Canton, Mass.	Plymouth Rubber Co.
Geo. H. Howard	Philadelphia, Pa.	Electric Storage Battery Co.
F. E. Storer	Somerville, Mass.	Davidson Rubber Co.
Robert S. Posmontier	Philadelphia, Pa.	Quaker City Rubber Co.
W. E. Glaney	Watertown, Mass.	Hood Rubber Co.
L. E. Best	Watertown, Mass.	Hood Rubber Co.
C. W. Howlett	Wilmington, Del.	E. I. du Pont de Nemours & Co.
R. B. Earle	Watertown, Mass.	Hood Rubber Co.
N. E. Tousley	Watertown, Mass.	Hood Rubber Co.
J. W. Long	Stoughton, Mass.	Panther Rubber Mfg. Co.
W. J. McCarthy	Stoughton, Mass.	Panther Rubber Mfg. Co.
H. B. Underwood	Racine, Wis.	Racine Rubber Co.
H. B. Seymour	New York City	The Rubber Age and Tire News
D. Spence	Norwalk, Conn.	Norwalk Tire & Rubber Co.
John Young	Akron, Ohio	Firestone Tire & Rubber Co.
Harry Wotring	Jonesboro, Ind.	Indiana Rubber & Insulated Wire Co.
Geo. P. Loomis	Chicopee, Mass.	A. G. Spalding Bros.
S. J. Strobel	Belmont, Mass.	Boston Woven Hose & Rubber Co.
H. M. Koelliker	Cleveland, Ohio	Mechanical Rubber Co.
J. D. Morron	Cleveland, Ohio	Mechanical Rubber Co.
I. W. Bommer	Chelsea, Mass.	Converse Rubber Shoe Co.
A. F. Hutchinson	Malden, Mass.	Converse Rubber Shoe Co.
C. W. Bedford	Akron, Ohio	Goodyear Tire & Rubber Co.
A. V. H. Mory	Chicago, Ill.	Sears Roebuck Co.
W. B. Pratt	Boston, Mass.	W. B. Pratt.
P. E. Holloway	Boston, Mass.	
H. S. Miller	Boston, Mass.	W. B. Pratt.
R. R. Cowen	Boston, Mass.	
M. H. Pingree	South Braintree, Mass.	Monatiquot Rubber Works Co.
H. J. Conroy	Melton, Mass.	Bay State Wire & Cable Co.
D. W. Wilson	Boston, Mass.	Factory Mutual Laboratories.
H. P. Gurney	Brookline, Mass.	Boston Belting Co.
T. R. Manahan	Plainfield, N. J.	
R. D. Gale	Reading, Mass.	Reading Rubber Co.
M. Omansky	Boston, Mass.	Boston Woven Hose & Rubber Co.
M. P. Whipple	Hudson, Mass.	Apsley Rubber Co.
L. S. Crosby	Dorchester, Mass.	Boston Woven Hose & Rubber Co.
J. P. Millwood	Passaic, N. J.	Okonite Rubber Co.
W. E. Kavenagh	Canton, Mass.	Plymouth Rubber Co.
A. T. Saunders	Chicopee, Mass.	A. G. Spalding Bros.
John R. MacGregor	Chicago, Ill.	Eagle-Picher Lead Co.
H. F. Turney	Rome, N. Y.	Rome Wire Co.
W. J. Orr	Chicopee, Mass.	A. G. Spalding Bros.
S. H. Rood	Hartford, Conn.	Lorenz & Lorenz.
C. W. Sanderson	Springfield, Mass.	Fisk Rubber Co.
W. Kritcheesky	Chicago, Ill.	
F. C. Atkinson	Indianapolis, Ind.	
W. F. Zimmerli	Rochester, N. Y.	Pfandler Co.
Isaac H. Levin	Dayton, Ohio	Electrolytic Oxy-Hydrogen Lab.
Frederick J. Maywald	New York City	
John E. Keefe	Jamaica Plain, Mass.	Boston Woven Hose & Rubber Co.
F. M. Kennedy	Boston, Mass.	W. B. Pratt
G. R. Alden	Melrose, Mass.	Boston Rubber Shoe Co.
L. E. Weber	Boston, Mass.	Chairman, Rubber Section, American Chemical Society.
John B. Tuttle	Washington, D. C.	Bureau of Standards.

Information Exchange

In this department are printed inquiries of a technical or commercial nature that are received by The Rubber Age and Tire News. *Readers are invited to send helpful replies to the questions asked, so that they can be printed in this department.*

Rubber Thread

Letter from V. L. W., New York.—We don't understand some of Georges Dumont's reasoning in his article on "Rubber Thread," which appeared on page 350 of the Rubber Age and Tire News. The part that is not clear to us reads as follows:

"Grey sulphur blooming thread has given away to black and red threads which are not as lasting as the former because they oxidize sooner. This more rapid oxidization is probably due to the absence of free sulphur in all grey threads."

We can't help but feel that Mr. Dumont did not intend to have it printed in this way. Surely no one will not admit that the main reason of oxidization is free sulphur left in compound. We would appreciate your passing this on to Mr. Dumont.

Reply from Georges Dumont.—Your quotation of the sentence of my article on which your criticism no doubt centers is slightly wrong. I wrote: "This more rapid oxidization is probably due to the absence of free sulphur in all but grey threads," meaning that the average black and red threads are cured up to a point where there remains in them little or no uncombined sulphur. My experience has been that threads and rubber goods in general, when cured to this extent, lose their "nerve" and become brittle more rapidly than goods containing free sulphur to the extent that they will "bloom" slightly when exposed to light. My theory is that sulphur, besides vulcanizing rubber, preserves it. Of course it would not do to have too much free sulphur, which would continue to be active after vulcanizing and would eventually overcure the goods, causing them to become porous and consequently to oxidize. I have obtained excellent and very durable red threads by using antimony sulphurets, but all rubber threads do not owe their color to antimony.

Calender, Washer and Mill

Inquiry from O. N. T. R. C., Akron, Ohio.—We want to buy immediately a calender, a washer and a mill, eventually other equipment or an entire plant. Perhaps you know of some concern wishing to dispose of such articles.

Technical Course in Rubber Manufacture*

By H. E. Simmons, B.S., M.S.

Professor of Chemistry in the Municipal University of Akron

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SECTION VI

Rubber Plantations and Their Development—*Continued*

At the age of from four to six years the trees have become large enough to be tapped and begin to yield a small return. At this age the workers go through the plantation and measure the trees to ascertain what ones are suitable for tapping. Any tree which has a girth of eighteen inches three feet above the ground is marked for tapping. They have found that trees of this size have bark thick enough so that it will renew and that tapping will not permanently injure the tree.

After the trees are selected for tapping the operation becomes purely a routine one. The laborer starts out early in the morning and taps the trees allotted to him, at this time placing the little cups in position to collect the latex.

When the trees are through running, which is determined by sending out inspectors, the tapper then revisits the trees which he tapped, taking with him two large enameled buckets. Into the one he pours the latex from the cups; in the other bucket he has a small amount of water in which he washes the cup and inverts it beside the tree so that it will be clean and ready for the next day's use.

When this is done he takes his latex to the central collecting station or in some cases directly to the coagulating house. This in brief constitutes the routine life of a rubber gatherer.

The different methods of tapping on the plantation have been studied to some extent. There are two general terms in use for this. "Incision" is done by puncturing the bark, while "excision" means the removing of some of the bark.

Several "incision" methods have been used and are still in use. There was at first a practice copied after the natives' method, of making a large gash in the tree. Later two gashes were joined together in the shape of a V.

Then the practice of pricking the bark was tried. A good flow of latex was secured and the recovery was rapid, but it took too much time to perform the tapping and the latex was difficult to collect. The former difficulty was removed when Bowman recommended his rotating spur-shaped pricker. A single stroke with one of these tools would make a row of incisions running across the bark of the tree. The latex was hard to collect so they combined this method with the one of making a shallow channel in the bark to carry the latex. This however seems to injure the trees.

MARKING TREES FOR TAPPING

In Ceylon they tried tapping by use of the herring-bone system where each rib was not a channel but four ribs made by a pricker. With the aid of a tapper, the latex can be made first to follow into the central channel and thus be collected.

Bamber suggested a method of incision which produces large quantities of latex. He made two vertical channels on opposite sides of the tree; then, beginning at the top, he made transverse cuts from one to the other extending to the bottom. He would skip a day then make his vertical sections an inch to the right of the original ones and tap the tree in the same manner. This was repeated until the whole circumference of the tree had been tapped. This method has the objection first of consuming a large amount of time; second, that the trees when fully tapped must be allowed a rest period; and third, that of the large amount of rubber which coagulates on the tree and was collected as scrap.

At present nearly all the tapping is done by "excision" methods, or the removing of the bark.

The exact time depends somewhat upon the length of time given for the removal of the bark. Four years seems to be the average time allowed for this, although there is a common belief that a longer time should be allowed. But when four years is decided upon, they divide the circumference of the tree into four equal parts, and tap each quarter by the half-herring-bone method. Each quarter then represents a year's tapping. To preserve the symmetry of the tree, the second year they tap the quarter opposite the one first tapped and the other two sections successively.

To mark the tree for tapping, a horizontal line is marked around the tree about four feet from the ground. From this line just five inches apart, if the tree has a girth of twenty inches at this point, two vertical lines are marked down the tree. Then five inches down on one line, a point is marked and, when a line is drawn from this point to the intersection of the other vertical line with the horizontal one, it makes an angle of 45 deg. with the vertical ones. This establishes the angle for cutting and removing the bark.

The one vertical line is now made a broad deep channel for conducting the latex, and the other is made deep enough to preserve the limits of the year's tapping. Along the oblique line, a groove is cut deep enough to allow the latex to flow and not to injure the cambium.

That operation constitutes the first tapping. On alternate days generally another thin slice of bark is removed from the lower edge and thus the process goes on until the season of tapping is over and by that time the bark has been removed from this quarter of the tree. Great skill is acquired by some of the workers in this form of tapping. From the following table some idea of the amount of rubber produced per acre can be gained:

Age of trees.	CEYLON.		MALAYAN.	
	Per acre.	*Per tree.*	*Per acre.*	*Per tree.*
Years.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
4-5	50	.4	100	.8
5-6	100	.6	150	1.0
6-7	150	.8	200	1.3
7-8	200	1.2	250	1.6
8-9	250	1.5	350	2.2
9-10	300	1.9	400	2.5

(This table is taken from the report of R. H. Lock.)

* This course commenced in the July 10, 1917, issue of THE RUBBER AGE, and will be complete in 28 issues.

HALF-HERRINGBONE TAPPING

We shall next discuss the handling of the latex which generally contains about thirty-five per cent caoutchouc. This latex is brought into the place of coagulation either in large enameled buckets on the heads of the gatherers or it may be brought by them simply to a collecting station in this manner and from there sent by a railroad system to the factory for treatment.

The first process is that of coagulation. Some large plantations use tank carts drawn by bullocks.

The substance used to the greatest extent for this purpose is acetic acid. It is said that 99¾ per cent of the plantation rubber is coagulated by this reagent. The amount to be used varies considerably but fortunately it may be used through quite a range and not impair the rubber.

Some one has suggested that an indicator like litmus be added to the latex, which is alkaline, then add the acid until it shows an acid reaction. This has not been found to work satisfactorily in the hands of inexperienced labor. Then too the latex varies and in some instances that amount of acid is not sufficient to cause coagulation as rapidly as desirous.

The safest rule is to make preliminary tests on each batch of latex and thus ascertain just how much acid is required to produce the best results. No rule of thumb is found to work in all cases. Parkin recommended the use of one part of acetic acid to eleven hundred parts of latex.

The acid is first measured out and then diluted with water when it is added to the strained latex and thoroughly stirred, then allowed to stand for some time, depending upon what form the finished rubber is to be in.

If crêpe is being made the spongy rubber is removed after it has stood about half an hour and is transferred to a washing machine.

If sheet is to be made it is coagulated in shallow pans. These are allowed to stand until the rubber is firm and can be removed in one sheet. This generally takes several hours. These sheets are then passed between smooth rolls running at the same rate with a stream of water playing over them. This is to remove the traces of acid which remain after the coagulation.

When preparing crêpe the washing is done upon a machine which has corrugated rolls and these run at different speeds. The rubber comes out in a long lace-like strip which will dry quickly and is then ready for packing.

The drying is done either by hanging up the rubber in an airy room, from which the light must be excluded, and allowing it to remain there until it is dry. In moist climates this takes a long period of time. To shorten this hot air has been blown into these rooms and thus hastens the drying. Prolonged exposure of the rubber, however, to a high temperature often renders it tacky.

As a still quicker method vacuum driers have been used. Some manufacturers contend that the life or nerve of the rubber is killed by drying in a vacuum. This, however, is a debatable question.

The crêpe after being vacuum dried is then run through a machine which you might say recrêpes it, for the vacuum drier tends to make it fluffy. In some places in connection with the slow drying process they have imitated the smoked rubber from South America by blowing the smoke from burning green wood or coconut husks into the drying rooms where either the crêpe or sheets may be hanging. Rubber treated in this manner is known as smoked crêpe or sheet and has been at a premium in the market.

Machines and methods for smoking the latex directly have been patented from time to time but as yet none of these are used to any extent.

Block rubber is made by pressing together either smoked or unsmoked sheet or crêpe. In this form it is handled conveniently but when it comes to the factory for use it must be cut up, which takes labor, and then too it may contain objectionable substance in its interior.

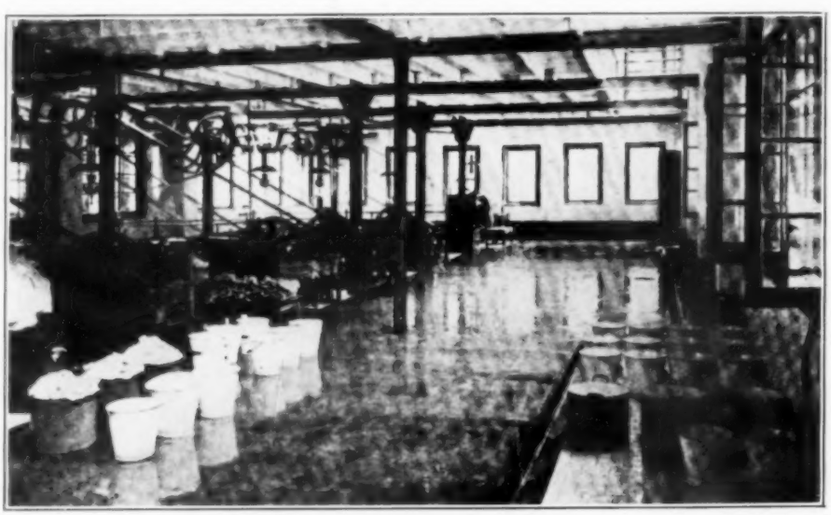
The highest grade of rubber is prepared from strained latex and is known as first latex rubber.

On the large plantations the scrap, that which is coagulated upon the trees and collecting receptacles, is worked up first on mascerating machines, then washed and comes out in a form of crêpe which is graded according to its color.

It is well perhaps that we should call attention to some of the pests with which the rubber planter must contend.

The one that causes most trouble is one over which man has not much control, namely the wind. *Hevea* trees cannot be grown in wind-swept districts unless the planter is able to establish a barrier or wind break.

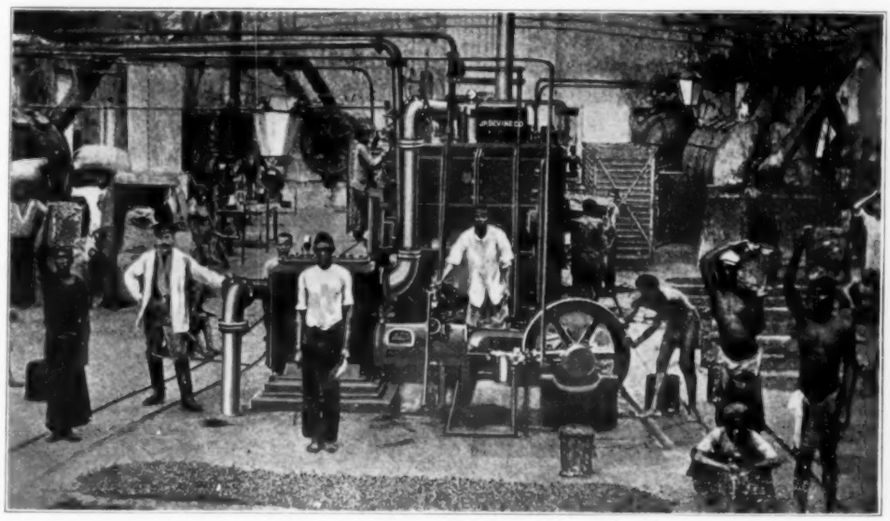
The animals which are a great nuisance are elephants, deer, cattle, pigs, monkeys, and porcupines. If you will observe this list carefully you will undoubtedly come to the conclusion that it would be a difficult task to fence against such a menagerie as this.



FACTORY ON RUBBER PLANTATION

Not much damage is done to the *Hevea* by boring insects as the presence of the latex protects the trees from their attack. If a fungus growth should kill the bark in certain areas then some stinging insects will attack the tree at these places.

A species of white ants, however, must be carefully watched for. They attack the roots of the tree and then eat out the interior of the tree. Their presence remains very often unsuspected until the leaves of an apparently healthy tree all at once wither. They can be discovered by digging a small trench around the tree and noticing whether there are any passage ways leading out to their nest which is always located a little distance from their food supply. The fumes of sulphur and white arsenic will kill them.



VACUUM DRYING ON A PLANTATION

There is a slub which seems to flourish upon the latex of these trees and often does considerable damage. Painting a band of tar about the tree is sufficient to guard against this pest.

The greatest pests to the planter are those of a fungus growth. Some attack the roots, some the stem and branches and even the fruit.

The fungi which attack the roots are the hardest to deal with. Generally their presence is not discovered until a few trees are blown down due to the killing of the roots. All affected trees must be destroyed and lime forked into the soil. This treatment will kill the pest.

The diseases of the stem are called canker. They are fungi which develop under the bark and tend to destroy it in such a way that it softens and rots. As soon as it is discovered it should all be cut away and then the tree if allowed to rest will heal over the infected area. This same fungus will spread over the tree and attack the seed pods causing them to rot also.

"Pink disease" and "die-black" are terms familiar on the plantation and must be diligently sought out and cared for when detected.

Great care must be taken to prevent the spread of any of these pests, and if that is done promptly the task of controlling them is not difficult.

Some other species of rubber trees have been tried in these countries. For instance, *Castilloa* had been under trial in Ceylon, the West Indies, and New Guinea, besides in the localities mentioned in our last issue.

The *Mannihot* has been tried and is still being worked to some extent. As early as 1883 there were nearly a thousand acres of it under cultivation in Ceylon. The tapping is rather difficult and it has not, therefore, met with any degree of favor from the planter.

Funtumia has been tried on plantations in Africa as we have pointed out in a previous article.

Ficus elastica, a rubber tree native of Asia, has been planted in Java and Dutch East Indies but the yield of rubber is so small that in some instances they have been cut down and *Hevea* planted in their stead.

There has been a lack of uniformity in plantation rubber in the past, and strange as it may seem it is the fault of the rubber manufacturers. The planters are anxious to produce the grade of rubber most in favor with the ultimate consumer, whose specifications have been so often changed that the plantation managers have been at a loss to know just what grade is going to suit the trade when they buy their next consignment.

This condition simply brings to our attention more forcefully that the whole industry is still in the experimental stage.

There are those today who are of the opinion that the plantations in the East are not going to be able to compete with the West in the future. Also that when the large acreage of planted rubber trees are matured and come into full production there will be so much crude rubber on the market that it will not pay a return sufficient to justify the continuance of the industry. However that may be we know that condition is not bothering us at present.

The labor condition is becoming a very serious question on these plantations. A great many of the laborers are imported from India and Java, to such an extent that these two governments are taking steps to stop the emigration of their people.

The native of the Malay States is not of much value in the industry. He is too proud and lazy to work under the direction of a superior. If some task is given him where he feels independent he will work fairly well.

The Chinese have been brought to the plantation and they are somewhat of the same temperament with the exception that they are more industrious and soon come to value too highly their services.

The Late Clayton Beadle

Clayton Beadle, the well-known rubber research chemist, died at his residence at Sidney, Kent, England, on August 16, after a long illness. He was 49 years old.

His early reputation was made in connection with cellulose, and while engaged in the study of this subject, he had a long association with Cross and Bevan, his name appearing in the original viscose patent.

He married a daughter of the late Andrew Pears, of Isleworth, and thus became a member of a family closely connected with the pioneer work of the rubber planting industry. This directed his attention to rubber and after carrying out various investigations for the Landron Rubber Estate, he took up rubber research in association with Dr. H. P. Stevens, forming the partnership Clayton Beadle & Stevens, whose joint names appeared at the head of so many important contributions to the world's knowledge of rubber and its chemistry.

Among the honors conferred upon him by many scientific bodies were the John Scott Legacy Medal and the Premium of the Franklin Institute.

THE
RUBBER AGE
AND TIRE NEWS

Vol. II | September 25, 1917 | No. 1

WITH this issue THE RUBBER AGE AND TIRE NEWS enters upon its second volume. In looking back, the time seems very short for what has been accomplished. The starting of a new publication in any field always is a difficult task; the amount of work required in organizing and issuing a technical trade publication is always much greater than its readers realize: but the success attained is worth the effort expended.

Starting as this publication did at the time when manufacturers and those from whom they buy their supplies and equipment had more orders than they could fill, and desired no additional orders, the establishing of this publication is now unusually gratifying and the cooperation and support that were given by the industry after the character of the matter printed for its benefit was realized are appreciated.

That there was a real demand for a publication conducted along progressive and constructive lines was demonstrated by the fact that the subscription list soon developed into such proportions that the paid circulation quickly exceeded that of all other rubber papers. Today the publishers feel that THE RUBBER AGE AND TIRE NEWS has attained a position in the industry that is as unique as it is noteworthy.

The policy that has been so successful in the past will be continued in the future. All the best technical news articles will be printed, and the one endeavor will be to make this publication of the greatest constructive help and value. Technical matter of the highest quality will be offered in increasing volume, as the educational value of this is believed necessary to the constant advancement of the rubber industry.

THE TIRE NEWS, the department that was recently added to THE RUBBER AGE, was started to meet a demand that came from subscribers, who wanted more practical tire information than is printed elsewhere. While this department is yet new, it has already many appreciative readers. Before long some special features will be announced that it is believed will make it of the greatest worth to the tire manufacturer, distributor and dealer.

Transportation Problems

Increased cost of raw materials and labor, added to uncertain transportation facilities, have been the causes assigned for the recent raise in tire prices.

Many cars are being sent to mines by Government order to relieve the coal situation. Each individual manufacturer should assist in relieving the congested freight condition by seeing that his freight yard is used to best advantage.

A yard is not designed for storage purposes, nor is it intended to be used for the movement of half empty cars.

Many suggestions have been made to relieve this congestion, and rubber manufacturers who have not already done so should place themselves in a position to aid the railroads and the Government by following a definite and efficient schedule, such as:

1. Anticipate your wants and order your supplies far enough ahead to allow the railroads plenty of time for transportation.
2. Ship your freight promptly by the most direct route and allow the carriers plenty of time to get shipments to or from destinations.
3. Do not trace shipments unless absolutely necessary.
4. Purchase in carload lots if possible.
5. Load cars promptly when placed and furnish shipping instructions without delay.
6. Mark packages plainly and prevent shipments going astray.
7. Be sure that the bill of lading shows the same destination and consignee as the marks on the package.
8. Deliver shipments to depot as early in the day as possible.
9. Unload cars promptly.
10. Load trap cars heavier and in a more systematic manner.
11. Induce customers to increase orders which usually move in less-than-carload lots to an amount requiring a full car.

Superiority of American Rubber Gloves

That American rubber gloves such as are used by surgeons are superior to those of British make is evidenced in discussions growing out of the action of the British Government in limiting the importation of these articles although there is now a shortage in Britain. Licenses to import have been granted, but the British Medical Association is urging that the importation in ample quantities should be encouraged and that the formality and delay of obtaining licenses be dispensed with.

One of the large dealers in England has stated positively in *The India Rubber Journal* that he cannot get British gloves to equal the American and Canadian goods.

War Revenue Bill Passed by Senate

Largest Tax Measure in American History—Amendment Restricts Its Operation for Duration of War—Text of Tax on Automobiles and Report of Senate Committee on Finance

(Special Washington Correspondence)

WASHINGTON, D. C., September 19, 1917.

The great War Tax Revenue bill, carrying more than $2,400,000,000, reported to be the largest tax measure in American history, passed by the House on May 23, was passed by the Senate on September 10 by a vote of 69 to 4. Senators Borah, Gronna, La Follette and Norris voted against the measure. Just before the passage of the bill, Senator Brandegee succeeded in having passed an amendment restricting the operation of the law for the duration of the war.

As passed by the Senate the measure yields revenue under its various titles as follows:

Income taxes	$842,200,000
War-profits taxes	1,060,000,000
Liquors	218,000,000
Tobacco	56,600,000
Public utilities, etc.	141,750,000
Autos, patent medicines, etc.	48,100,000
Admissions, etc.	18,000,000
Stamp taxes	22,000,000
Virgin Island products	20,000
	$2,406,670,000
Under existing law	$1,300,000,000
Total	$3,706,670,000

Senators Simmons, Stone and Williams, Democrats, and Penrose and Lodge, Republicans, were named as Senate conferees.

It was learned late today that protests have been submitted to the conferees on the war tax bill from general business interests, aside from those concerned with furnishing munitions and war supplies, that the proposed method of taxing profits will work discrimination and injustice against many lines of small industries and general business enterprises.

The final vote between the conferees is now fast approaching. Much progress was made yesterday on many important disputed points. The conferees decided to adopt a zone system for increasing second class mail rates, discussed the war profits and income tax sections and expect to vote today. Postmaster Burleson appeared before the Committee of Senate and House conferees yesterday in behalf of the special advertising increase plan and Secretary McAdoo supported the McKellar plan, objecting to drastic rate increases.

A general increase of ¼ of a cent a pound until 1918 and 1 cent thereafter, with a zone system of special increases on advertising portions of publications were said to be features of the compromise being drafted.

Other agreements reported were on the passenger transportation and automobile tax provisions. In lieu of the House tax of 10 per cent and the Senate rate of 5 per cent on the former, the conferees were said to have compromised on 8 per cent, estimated to yield about $57,000,000 as compared with $75,000,000 under the original House plan and $37,500,000 under the Senate revision. For the Senate Federal license tax on automobile owners of about 1 per cent of original list prices of pleasure cars, the conferees were said to have returned to the House plan for taxing manufacturers' sales, at about 3 per cent., and exempting motor trucks.

Definite conclusions regarding administrative and corporate provisions of the income tax sections and the war excess profits clauses were not reached, the conferees working on a compromise proposed for taxing excess profits with an exemption of 8 per cent. Treasury income tax experts were consulted regarding corporation tax features, including exemption of dividends received from other corporations.

AUTOMOBILES

As passed by the Senate the automobile tax in the War Revenue bill reads as follows:

TITLE VI.—WAR EXCISE TAXES

"Sec. 600. (a) That on the day this Act takes effect, and thereafter on July first in each year, and also at the time of the original purchase of a new automobile or motorcycle by a user, if on any other date than July first, there shall be levied, assessed, collected, and paid, upon the use of automobiles and motorcycles not used exclusively for business, an excise tax at basic rates as follows: Motorcycles, $2.50; automobiles the original listed retail price in the United States of which is not over $500, $5; original listed retail price over $500 and not over $750, $7.50; original listed retail price over $750 and not over $1,000, $10; and for each further increase of $500 or fractional part thereof of original listed retail price up to and including the original listed retail price of $3,000, an additional tax of $5; and for each further increase of $500 or fractional part thereof of original listed retail price, an additional tax of $10.

In the case of a tax imposed at the time of the original purchase of a new automobile or motorcycle on any other date than July first, the amount to be paid shall be the same number of twelfths of the amount of the tax as the number of calendar months, including the month of sale, remaining prior to the following July first.

The tax payable in any year shall be reduced by ten per centum of its basic amount for each twelve months elapsed since the original sale of the automobile or motorcycle by the manufacturer or importer, but in no case shall it be reduced to less than fifty per centum of such basic amount."

In reporting the bill, the Senate Committee on Finance, reported as follows:

"Title VI of the House bill imposes a tax of 5 per cent upon the gross sales of automobiles, automobile trucks, automobile wagons, and motorcycles, and automobile, motorcycle, or bicycle tires sold by the manufacturer, producer, or importer. A tax of 5 per cent upon the gross sales under any circumstances would be a heavy tax. It is many times heavier than a tax at the same rate upon net profits; and it is to be considered that under the pending bill and under the present law these same manufacturers are subjected to high taxes upon their net profits and a heavy additional tax upon their excess profits. Your committee felt that only where the conditions are exceptional could such a tax be justifiable, and then only at a lesser rate.

"A gross tax upon automobile manufacturers was first considered, but upon thorough investigation it was found that over 80 per cent of the manufacturers were making very small profits. A few were making enormous profits.

"A gross production tax in size sufficient to produce a substantial return would have driven out of business the large majority of the automobile manufacturers.

"Largely for this reason such a tax was found to be impracticable.

"After careful consideration your committee concluded that the automobile was a proper subject upon which to impose a war-revenue tax, and it recommends as a substitute for the high gross-sales tax which might or might not be passed on to the purchaser, a moderate excise tax upon the owner of automobiles, motorcycles, etc., and therefore includes in the bill a graduated tax, as follows, upon automobiles and motorcycles: Motorcycles, $2.50; automobiles, the original listed retail price of which is not over $500, $5; original listed retail price over $500 and not over $750, $7.50; original listed retail price over $750 and not over $1,000, $10; and for each further increase of $500 or fractional part thereof of original listed retail price, an additional tax of $5."

Price Control Legislation

A referendum to ascertain business opinion on price control is being sent forth by the Chamber of Commerce of the United States which carries a committee recommendation that the National Chamber favor additional legislation to create authority to control prices during the war. Business organizations throughout the United States will have an opportunity to vote for or against such a recommendation and forty-five days will be given to them to discuss the subject.

After going very thoroughly into this subject the National Chamber Price Control Committee has recommended that authority to control prices should extend to all articles which have importance in basic industries as well as in war and which enter into the necessaries of everyday life; that authority to control prices should be extended to raw materials and finished products; that authority to control prices should extend to the prices the public pays as well as those paid by the government and that authority to control prices should be administered by a small executive board appointed by the President.

It is pointed out by the committee that control of prices charged to the government, whether exercised under authority of law or through voluntary arrangement with the sellers, leaves the situation of private buyers, who have to meet their requirements out of a diminished supply, worse than before the prices to the Government were dealt with. This is the case, too, it is further pointed out, whether the position of industries buying for further manufacture is considered or the situation of ultimate purchasers among the public.

Warns of Sulphur Shortage

The Subcommittee on Fertilizers of the Committee on Chemicals of the advisory Commission of the Council of National Defense issues the following:

"Owing to the serious car and coastwise boat situation, and to the probability that sulphur transportation difficulties will increase rather than diminish, we cannot too strongly urge that the largest possible use be made of the domestic pyrites as well as of such foreign material as can be secured. Many small domestic mines are being opened up. Offerings will be made from time to time, and these developments should be encouraged as much as possible. It is also wise to maintain large sulphur reserves at the mines, and you cannot count on an unlimited sulphur supply."

A temporary embargo has been laid on all exports of sulphur to Canada pending an investigation by this Government of the sulphur requirements of the American military establishment. Canada has been asked to submit an estimate of what sulphur she will need for the manufacture of explosives and for industrial uses, especially the manufacture of newsprint paper. After both American and Canadian military requirements are met it is expected that some sulphur will be exported to Canada under special license for non-military use.

News of the Rubber Metropolis

Akron Boys Write from France—Selective Draft Men Given Send-Off—The Child Labor Law—Page Won Courtesy Prize—Davis Leaves Goodrich—Mason Enlarges—Seymour Hadaway Commissioned a Captain

Letters from Lindeman and French

(Special Akron Correspondence.)

Charles B. Lindeman, formerly of the Firestone advertising department, has written home a letter from "the back" in France. He is serving with a French munition train and writes:

"I have truck No. 13 and it burned out a bearing today, bringing me the good luck of my first day off since I arrived at the back."

The Akron man says he is getting thoroughly "shell-broke." He describes in a facetious style how it feels to be under fire. "We waited for several hours behind a roadside hedge," he says, "our car covered with branches from trees, while the Germans shelled a bridge we had to cross. Many of the shells broke within 75 ft. of us. After the Germans got through we slipped over the bridge at night, delivered our supplies and then waited several more hours while the enemy vented their feelings on another object of suspicion."

Lindeman says there are 24 Firestone men in his unit and all are giving a good account of themselves.

Another letter from France comes from Harold S. French, former Akron correspondent for THE RUBBER AGE AND TIRE NEWS. He describes a big bombardment, "Somewhere in France," in which two of his company were wounded. "The much talked-of fight at Verdun is trivial compared with the present great offensive," he writes.

Davis Leaves Goodrich

William H. Davis, Jr., until recently connected with the advertising department of the B. F. Goodrich Co., Akron, Ohio, has established an advertising agency in Akron.

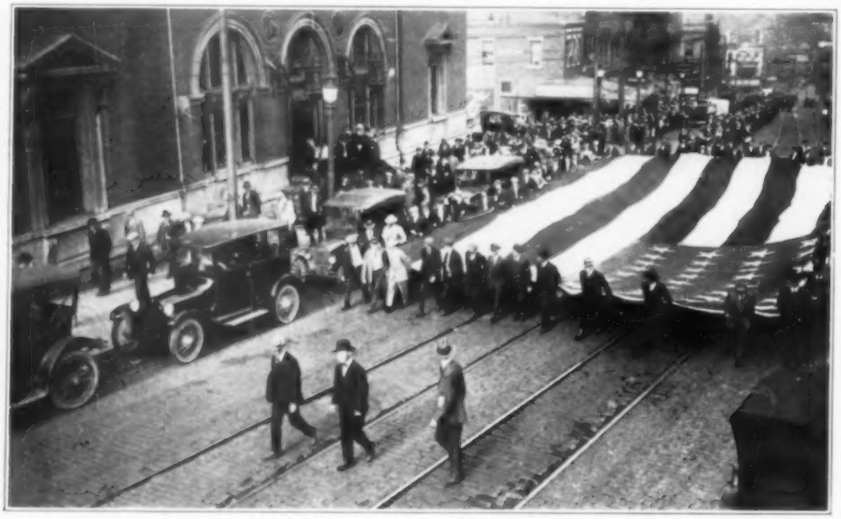
Mr. Davis is well known for conducting large local publicity campaigns, among which were those for the Red Cross and the Liberty loan. He has had a very wide experience in advertising and is sure to make a success in his new enterprise.

Child Labor Law

The B. F. Goodrich Co. of Akron, Ohio, has sent letters containing extracts of the National Child Labor Act to all concerns transacting business with them and asking such concerns to subscribe to the following:

"All goods manufactured or produced by us for you are and will be in full conformity with the provisions of the Federal Child Labor Law."

It is provided pursuant to Section 5 of this law, "That no dealer shall be prosecuted under the provisions of this Act for a shipment, delivery for shipment, or transportation who establishes a guaranty issued by the person by whom the goods shipped or delivered for shipment or transportation were manufactured or produced * * * "



Akron's first contingent of selected men which left for the Ohio cantonment at Chillicothe on September 7. During the farewell exercises the men paraded the streets lined with cheering citizens and carried the giant Goodrich flag, said to be the largest ever flown.

Mr. Page's Definition Wins Prize

Under date of September 12, we received the following letter from Mr. S. V. Norton, manager of the Truck Tire Sales Department of the B. F. Goodrich Rubber Co., Akron, Ohio:

"EDITOR OF RUBBER AGE AND TIRE NEWS:

"In your issue of August 25 there was an item to the effect that I had won a prize of $5 for giving the best definition of courtesy. Will you permit me to say that unfortunately you have misstated the case.

"It so happened that Mr. C. A. Dunham, manager of our Cleveland office, wanted to use this method of developing the idea of courtesy in his organization and so he conducted this contest some little time ago. As he wished to have the matter settled without personal bias, he referred all the definitions to me, asking me to select what I thought was the best. From all those submitted, I chose the one you have printed, which was submitted by Mr. Harry B. Page, chief tire adjuster of that branch.

"In view of these facts, will you please be kind enough to insert a correction, giving the proper credit to Mr. Page."

Goodyear Field Day

The second annual field and track meet of the Goodyear Tire & Rubber Co., at Seiberling Park, Akron, Ohio, on Labor Day, proved to be the most elaborate athletic carnival ever staged by any private corporation in the country. It far eclipsed the initial field meet of last year both in attendance and general character of program, which consisted of quoits, tennis, bait-casting, baseball throwing, obstacle races, nail driving, cock fights, egg races, relay races, dashes of all lengths, shoe races, walking races, jumps of all kinds, shot puts, tugs-of-war, boxing, wrestling, cross country runs, and bicycle and many novelty races.

The day's festivities opened promptly at 9 a. m., with boxing and wrestling followed by a thrilling baseball game between the Goodyear team and the Cleveland White Autos, former amateur world's champions. While the game was in progress, other events were being conducted in the oval.

The other features consisted of a military drill by a band of selected employes, who had been receiving military instruction for months. The afternoon program was completed by a spectacular flight of one of the company's dirigibles, which hovered over the field and dropped paper bombs containing prizes on the crowd. In the evening, the Goodyear band entertained with an elaborate concert, which was followed by a community "sing" by ten thousand persons.

New Buildings for Mason

The Mason Tire and Rubber Co., Kent, Ohio, continues to expand at a rapid rate. In order to take care of its rapidly increasing business, this company has found it necessary to erect immediately several new buildings.

A new warehouse is well under way and will be finished in a few months. The dimensions of this unit are 67 x 36 ft. by 75 x 70 ft., and will house raw products and take care not only of the present capacity of the plant but of double the capacity.

The new cement house, which is in course of construction, is 18 x 30 ft. and will contain five new cement mixers. The new boiler room, 18 x 32 ft., will be completed shortly and will house a Sterling boiler of 294 hp. capacity. In addition a new mill room is being built and an addition is being made to the vulcanizing room.

Plans are now being drawn for a new office building rendered necessary by the rapid increase of the office force. The restaurant recently opened is 26 x 42 ft., and is complete with up-to-date equipment.

The experimental laboratory has been refitted and it is claimed that it is the most extensive of the smaller rubber companies.

Engaged, Not Wed

Walter H. Bass of Gove & French, crude rubber brokers, Akron, Ohio, has not yet married Miss Kathryn Firey, the daughter of L. H. Firey, president of the Star Rubber Co., as was reported in a recent issue of THE RUBBER AGE AND TIRE NEWS. Their engagement, however, was announced on August 1, but no date has been set for the wedding.

Foreman Receives Captain's Commission

Seymour Hadaway, a foreman in the making department of the Goodyear Metallic Rubber Shoe Co., Naugatuck, Conn., has received a commission as captain in the United States Army and will go to France, where he will have charge of the repair work on boots and shoes.

Notes of Interest to the Rubber Industry

Letters of the Rubber Association and Children's Bureau on the Federal Child Labor Act—Association's New Members—Convention of Business Men

Activities of the Rubber Association

The Legislative Committee of the Rubber Association of America has addressed to its firm members a circular letter explanatory of the Federal Child Labor Act which became effective on September 1, 1917. The circular reads as follows:

"The Federal Child Labor Law is a prohibition against the interstate or foreign shipment of articles or commodities manufactured in factories in which child labor, as specified below, was employed:

"(1) Children under fourteen (14) years of age.

"(2) Children between fourteen (14) and sixteen (16) years of age,

(a) More than eight (8) hours in any work day,

(b) More than six (6) days a week,

(c) Before 6 A. M. or after 7 P. M.

"The law provides that dealers shall not be liable to prosecution for violations of this Act if the manufacturer gives a proper guarantee with the goods that no child labor was employed in their manufacture.

"Section 3, Regulation 12, of the rules formulated by the Board provided for by the Act, provides as follows:

"'A guaranty substantially in accordance with the following forms will comply with the requirements of the Act:

* * * *

"'For products of a mill, cannery, workshop, factory, or manufacturing establishment—

"'(I or we), the undersigned, do hereby guarantee that the articles or commodities listed herein (or specify the same), were produced or manufactured by (me or us) in a (mill, cannery, workshop, factory, or manufacturing establishment) in which within 30 days prior to the removal of such goods therefrom no children under the age of 14 years were employed or permitted to work, nor children between the ages of 14 years and 16 years were employed or permitted to work more than eight hours in any day or more than six days in any week, or after the hour of 7 o'clock p. m. or before the hour of 6 o'clock a. m.'

(Name and place of business of producer or manufacturer.)

(Date of removal.)

"During the month of September, 1917, a manufacturer may substitute for the clause 'within 30 days prior to the removal of such goods therefrom' the clause 'on and after September 1, 1917.'

"The above guaranty may be printed, stamped on, incorporated in or attached to the bill of sale, bill of lading, or other schedule containing a list of the goods shipped. It may be printed on the back of the invoice with the notation: 'Goods listed on the reverse side, etc.'

"It must be understood, however, that the guaranty cannot be in the form of a letter or printed contract covering goods to be manufactured.

"A number of inquiries have been received as to whether a shorter form of guaranty cannot be used and in answer to this inquiry we wish to refer you to the copy of a letter from the Children's Bureau of the United States Department of Labor enclosed herewith."

LETTER FROM THE CHILDREN'S BUREAU

The following is the letter, referred to, from the Children's Bureau:

August 21, 1917.

"2. Opinions of general interest regarding questions arising under the United States Child Labor Act.

"In your letter under date of . . . you submit the following form of guaranty and ask whether it meets the requirements of the United States Child Labor Act:

"'We hereby guarantee that no provision of the Federal Child Labor Act of September 1, 1916, has been violated in the manufacture of the goods covered by the document bearing this imprint.'

"Approval of similar guaranties has been requested by others. Regulation 12 of the Rules and Regulations for carrying out the Act gives a form of guaranty and a method of giving it, which has been approved by the Board of Secretaries as legally sufficient under Section 5 of the United States Child Labor Act to protect a dealer from prosecution. Should guarantors desire to give general guaranties to dealers or desire to use any form of guaranty different from that described in Regulation 12, it will be necessary for dealers to determine for themselves whether the form they are asked to accept is legally sufficient to protect them from prosecution. This Bureau cannot undertake to approve any form except that contained in Regulation 12."

TO HOLD A GOLF TOURNAMENT

It was voted at a meeting of the board of directors of the Association in New York on September 18 that a golf tournament be held on October 16 at the Trenton Country Club. The Outing Committee was charged with the organization of this tournament, which it is hoped will become an annual event.

The choice of Trenton for the holding of the first golf tournament was due to the suggestion of John S. Lambert, treasurer and general manager of the Acme Rubber Manufacturing Co. of that city, who offered the facilities of the club and promised that Trenton manufacturers would make the event interesting to all who will attend.

A letter regarding the event will be sent to the trade, and it is understood that any receipts above the expenses of the tournament will go to a tobacco fund for American soldiers.

At the same meeting Van H. Cartmell, president of the Kelly-Springfield Tire Co. of New York, was made a member of the Arbitration Committee in place of M. L. Cramer, purchasing agent of the Michelin Tire Co., Milltown, N. J., who resigned from the committee.

NEW MEMBERS

At a meeting of the Executive Committee held on September 18 at the Association's headquarters, the following were elected firm members of the Association:

The Vernon Metals & Produce Co., 25 Beaver street, New York; Robert M. Pearce, representing the Pearce Rubber Corporation, 932 North Broad street, Philadelphia, Pa.; Merrill N. Davis, representing the Rex-Hide Rubber Co., East Brady, Pa.; H. B. Polson, representing the Polson Rubber Co., Doan avenue and Nickel Plate Railroad, Cleveland, Ohio, and Edgar Hunt Wilson, representing the Dural Rubber Co., Flemington, N. J.

Fred Pusinelli, of Arnold & Zeiss, 277 Broadway, New York, was elected an associate member.

Enlisted and Drafted Men

Following is a list of the men who have enlisted from the Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn.: Albert Sumpf, Walter Goodwin, Stanley Rikoski, Ernest Johnson, George Lawson, David Ostrom, Thomas Truestrail, Willard Hicks, Edmund Bowler and Everett Coleman.

The names of employes of this company who have been drafted, are as follows: Patrick Falvey, Stanislaw Moskowski, Carl Olson, Harold Wheeler, William Painter and Jacob Bober.

Rubber Shipped to Germany in Tins

Among the various schemes that Germany is said to be using to obtain rubber and other much needed war supplies is the utilization of meat tins shipped through Scandinavian countries.

Only a small portion of the contents of the cans was meat, the balance actually being rubber. But an inquisitive British naval officer used a can opener and found rubber, even tougher than any beef sent to Cuba in '98. Now the agents of the Department of Justice are wondering what new trick they will have to combat, even though the embargo is in force.

Overalls at Cost

One piece garage suits of close woven khaki material as a protection against oil, grime and grease, are being used as an advertising novelty by the Raybestos Co., Bridgeport, Conn., manufacturer of guaranteed brake linings. These suits are offered at cost price solely for their

advertising value, ranging from $2.25 to $3.38 each, and have the word "Raybestos" stenciled across the chest. They are designed to permit entirely free action for the garage or engine worker, at the same time giving full assurance that clothes will not be soiled. Samples will be furnished upon request to those interested.

Convention of Business Men

The meeting of the War Convention of American business men at Atlantic City, September 18 to 21, brought out many statements from successful men, representing numerous industries, showing the necessity of active cooperation with the Government against a common enemy.

Legislation fixing a maximum price for all labor which creates war necessities was recommended as a radical and necessary step in Government price control. Franklin K. Lane, Secretary of the Interior, praised those business men who have aided the Administration in its efforts at price-fixing, but said that sympathy would not be shown to the man who endeavored to make a profit out of the present trials of the nation.

Waddill Catchings, chairman of the Chamber's committee, advocated the creation of two war boards similar to those in England, which handle purchases and munitions.

One of the principal addresses was made by Herbert C. Hoover, who declared that the business men of the country should combine to down profiteers.

It was shown how American business men can help to promote the development of transportation on land and sea and thus shorten the war.

Among the speakers, not already mentioned, were A. E. Albrecht, Secretary of War Baker, Boris Bakhmeteff, Russian Ambassador; Lord Northcliffe, Albert W. Shaw, John H. Fahey, Raymond B. Stevens of the United States Shipping Board, and Harry A. Wheeler, former president of the Chamber of Commerce.

Book Reviews

BUSINESS COMPETITION AND THE LAW. By Gilbert H. Montague; G. P. Putnam's Sons, New York. (318 pages, cloth bound. Price $8.)

After thirty years of trust-busting "the law of competition is really in its beginning." This book deals wholly with practical questions that have been threshed out by its author in court with judges and against opposing counsel, in conferences with United States attorneys and with the Federal Trade Commission, and in consultations with bewildered business men of various stations and degrees.

Congress does its best in vain. The law gets more confused with each attempt to show business men the lines of legality so that those who wish to keep out of jail find their task constantly harder. The trouble is less with the law than with the fact that "the views of the courts as expressed in a number of carefully considered opinions, under the Sherman Act, are not at all in harmony with the contentions of the Government as they appear in consent decrees in bills of complaint and in the Government's construction of the Clayton Act. * * * The Federal Trade Commission is now prosecuting the very manufacturer whom the Supreme Court upheld in the Mimeograph case and the prosecution is contending that the very condition which the Supreme Court there sustained has since been made unlawful by the Clayton Act."

The reason why the anti-trust agitation persists is that Congress will not cease legislating and the Attorney-General will not cease prosecuting along lines which the courts disapprove. The deadlock is likely to continue until the people take a hand and decide which policy they approve so clearly and positively that no official shall be above compliance with the law.

Mr. Montague is a lawyer who has had exceptional opportunities for information, but he writes sympathetically with men of business whom it is the especial delight of the Government to prosecute and with a better record for prosecution than for conviction.

OFFICE ORGANIZATION AND MANAGEMENT. By Carl C. Parsons; La Salle Extension University, Chicago, Ill. (8 vols., leather bound, 307 pages, illustrated.)

The office is the very heart of efficiency in any business institution. Its influence reaches every department and worker. Its records, reports and statistics furnish the manager with facts for the intelligent determination of executive policies. It is the means of securing final and complete accountability.

This importance of the office justifies the special treatise on its organization and management which has just been published by the La Salle Extension University and should particularly appeal to business men, office workers, office managers, general managers and students of business who desire systematized and well-organized knowledge on the principles and methods of successful office organization and management.

This book deals with the organization in general, the laying out of the office, employes, office training, rules and regulations, discipline, methods of payment, promotions, increasing efficiency, suggestions and ideas, the stimulation of efficiency, esprit de corps, vacations, encouragement of savings, making employes stockholders, pension systems, welfare work, the machinery of the office, records and systems, such as advertising department records, sales department records, credits and collections records, order department records, purchasing orders, stores records, shipping records and cost accounting records, the mailing department, the supervising of office work and finally, the office manager, what is expected of him and what he must be.

Throughout the work an attempt has been made to recognize adequately the importance of all these factors as elements in successful office administration. The book supplies a broad view of all phases of this important business department.

Miss Mathilde Moisant of California, who was the second woman in America to receive her license as an aviator, has volunteered her services to the Navy for duty at the Front in France. At present she is making surgical bandages and has fashioned an original doll cut from an ordinary red rubber bath sponge. From the proceeds of their sale as souvenirs, she is purchasing hot-water bags for use in the hospitals of France.

Boston Belting May Change Hands

The stockholders of the Boston Belting Co. have received an offer from Willett, Sears & Co. to purchase all its assets at a net price equivalent to $132.50 a share; $82.50 in cash and $50 in preferred stock of a new Boston Belting Corporation, to be incorporated under the laws of Massachusetts.

The directors of the Boston Belting Co. have unanimously accepted and recommended this offer at meetings held on August 18 and 20, 1917, and have called a meeting of the stockholders for September 14 to take action on the offer.

The par value of the new preferred stock which is to be offered in exchange will be $50 so that the stockholders of the Boston Belting Co. will receive one new share of preferred stock for each old share, together with a cash payment of $82.50 per share.

The issue of this preferred stock is limited to $500,000 of 6 per cent cumulative dividends, payable semi-annually on January 1 and July 1, dividends being cumulative from July 1, 1917.

It is preferred as to assets in liquidation up to $50 per share and accrued dividends and callable on ninety days' notice at $52.50 and otherwise properly safeguarded, in the opinion of the directors. The president, Thomas Forsyth, who has been connected with the company during his full business life, has written the following letter to stockholders:

"To the Stockholders of the Boston Belting Company:

"After more than fifty years of service with your company in various positions, from office boy to general manager and president, I feel that the time has come when I should be relieved from business cares. But for the exigencies of the situation, I should have retired some years ago, and now my opportunity comes in an offer for the company's property that I consider just and honorable; an offer which gives to each stockholder an absolutely equal price in money and preferred stock for his shares. This preferred stock I regard as an exceptionally safe investment, it being in my judgment fully safeguarded. In view of the long association of the Forsyth family with the Boston Belting Company I should be unable to approve any change that did not mean the continuance of the business with renewed vigor and determination. Being satisfied that this sale will insure the future of the company, and that the price offered is fair to all, I unhesitatingly advise the acceptance of the offer."

Practical Vulcanizing Hints

SAVE THE OLD TREAD.

Many tire repairmen still throw away a portion of the old tread in making repairs. This waste may be saved by cutting the tread at one end and skimming back far enough to allow the fabric plies to be taken out. After this fabric has been replaced the tread may be laid back, saving material and making a neater repair.

FITTING AIR BAGS.

Before a tire repair is cured the tire should be placed in the mold, with air bag deflated. The clamp should then be tightened until the bead molds fit snugly on the tire; then give the screw a half turn, and inflate the air bag to 70 pounds pressure. By working the air bag in this manner, undue strain is prevented and its life prolonged.

PREVENTS TIRES STICKING.

Expert repairmen have found that powdered sulphur serves the same purpose as cocoa butter. A pinch of sulphur is dropped in a mold, and when melted is wiped over the entire surface. Soapstone is then dusted into the mold and it is ready for the cure.

American Rubber Patents

ISSUED SEPTEMBER 4, 1917.

1,238,765—To George T. Heckman, St. Louis, Mo. Clamp for anti-skid device.

1,238,766—To Theodore Heinzerling, Brooklyn, N. Y. Rim for vehicle-wheels and means for securing it.

1,238,768—To Gregory C. Hill, Victor, N. Y. Insulator.

1,238,769—To Ernest Hopkinson, East Orange, N. J. Tire-carrying rim.

1,238,815—To John George Pool, Lynn, Mass. Machine for making heels for boots and shoes and the like.

1,238,879—To Elbert Brown, Tulare, Cal. Wheel-rim.

1,238,894—To Herman A. Davenport, Brockton, Mass., assignor to United Shoe Machinery Co., Paterson, N. J., a corporation of New Jersey. Heel support for lasts.

1,238,930—To Eduard Munch, Ludwigshafen-on-the-Rhine, Germany, assignor to Badische Anilin & Soda Fabrik, Ludwigshafen-on-the-Rhine, Germany, a corporation of Baden. Synthetic product resembling caoutchouc.

ISSUED SEPTEMBER 11, 1917.

1,239,454—To Clarence A. Boyd, Milwaukee, Wis. Tire-removing tool.

1,239,506—To William J. P. Moore, New York, N. Y. Demountable rim.

1,239,553—To Charles L. Archer, Minneapolis, Minn. Cord tire.

1,239,606—To Henry F. Klein, St. Anthony, N. D. Demountable rim.

1,239,628—To John H. Shoemaker and Henry Bruck, Portland, Ore. Shoe tap or half-sole.

1,239,711—To Fred E. Messler, Canton, Ill. Non-skid chain.

1,239,737—To George F. Steedman, St. Louis, Mo., assignor to Curtis & Co. Mfg. Co., Wellston, Mo., a corporation of Missouri. Tire inflating apparatus.

1,239,749—To Ernest Veltung, New York, N. Y. Non-skidding and tire-holding device for pneumatic tires.

1,239,813—To Philip Overman, Santa Barbara, Cal. Flexible closure for tire casings.

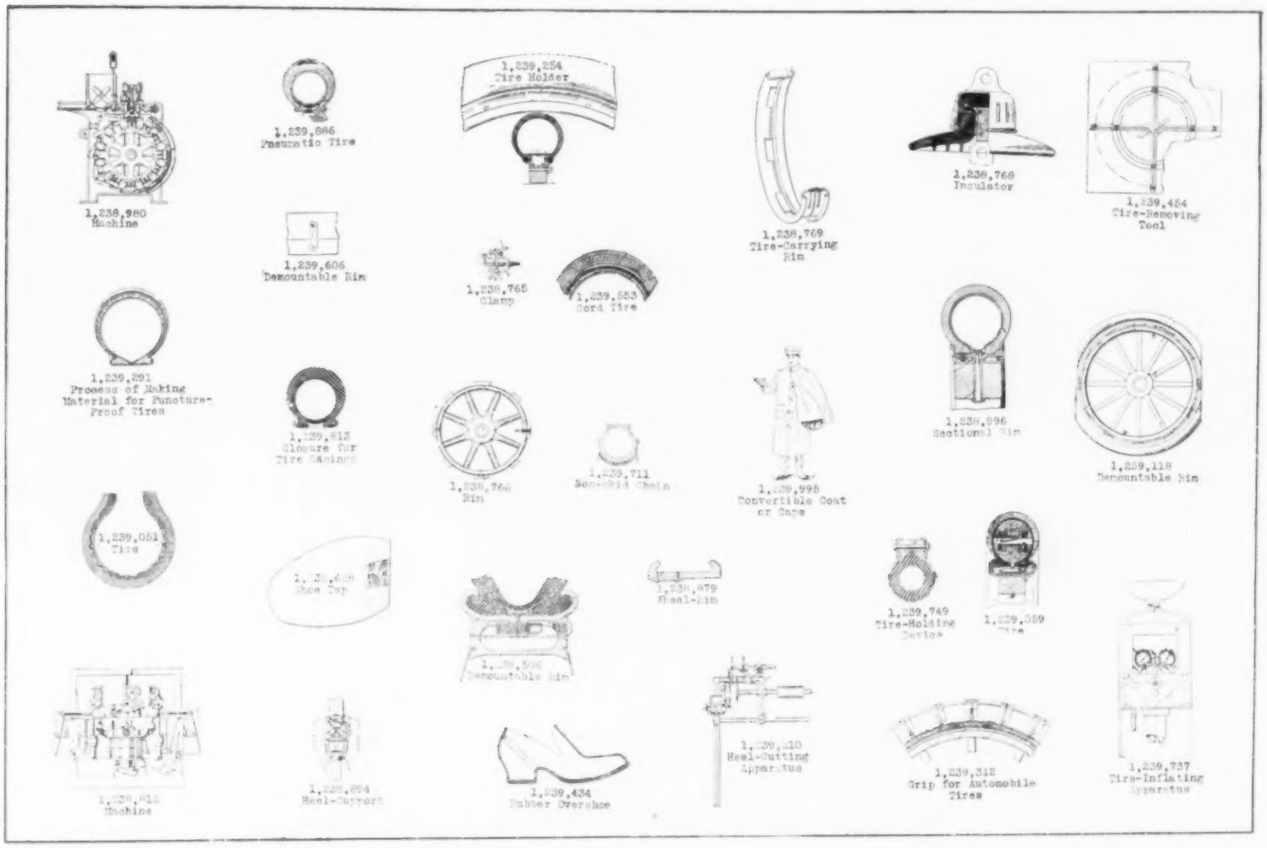
1,239,886—To Ernest E. Cole, Chicago, Ill. Pneumatic tire.

1,239,995—To John Cooper Whiteside, Rutherford, N. J., assignor to Hodgman Rubber Co., Yonkers, N. Y., a corporation of New York. Convertible coat and cape.

1,240,051—To Deforest E. Johnson, Hinsdale, N. Y. Pneumatic tire.

1,240,059—To William N. Knowlton, Brooklyn, N. Y. Vehicle tire.

1,240,116—To Gustave Bernstein, Royat, France. Vulcanization of rubber and other similar substances.



1,238,980—To Cesare Barbieri, Chicago, Ill., assignor to Black Products Co., Riverdale, Ill., a corporation of Illionis. Molding machine for plastic material.

1,238,996—To John Joseph Foley, San Francisco, Cal. Sectional rim.

1,239,118—To Herbert B. Manning, Fall River, Cal. Demountable rim.

1,239,180—To Marion M. Harrison, Akron, Ohio. Method of coloring rubber balloons.

1,239,208—To William J. Nesbitt, Los Angeles, Cal. Heel-cutting apparatus.

1,239,209—To William J. Nesbitt, Los Angeles, Cal. Heel-cutting apparatus.

1,239,210—To William J. Nesbitt, Los Angeles, Cal. Heel-cutting apparatus.

1,239,254—To George Gardner Buckland, San Francisco, Cal. Tire-holder.

1,239,278—To Jesse P. Larrimer, Brooklyn, N. Y. Tire.

1,239,291—To George O. Morse, Des Moines, Iowa, assignor of one-sixth to Alexander M. Linn, one sixth to Dwight Jarvis, and one-sixth to William W. Horras. Process of making material for puncture-proof tires.

1,239,312—To Patrick Smith, Foresthill, Cal. Grip for automobile tires.

1,239,434—To Emmett A. Saunders, South Bend, Ind. Rubber overshoe.

Recent Incorporations

Avolon Rubber Mfg. Co., Akron, Ohio; capital, $50,000; to manufacture rubber articles; incorporators, T. S. Briggle, L. B. Turner and W. W. Spears.

Clarksburg Tire Co., Charleston, W. Va.; capital, $25,000; to deal in motor car accessories; incorporators, W. H. Garrett, I. D. Starkey, H. Garrett, F. Starkey, and A. Garrett.

Quality Tire Shop, Grand Rapids, Mich.; capital, $3,000; to retail motor car supplies; incorporators, W. E. Pugsley and R. H. Luce.

Cornell Tire Sales Co., Cleveland, Ohio; capital, $50,000; to conduct a tire business; incorporators, John F. Wilson, E. J. Cornell, A. P. Garrett, W. E. Richey and P. O. Carter.

Standard Rubber Co., Portland, Me.; capital, $500,000; to manufacture and deal in rubber tires and tubes; incorporators, A. B. Farnham, B. B. Drew and T. L. Croteau.

Hints for Tire Repairing

Too many tire repairmen buy the cheapest repair materials they can get and then wonder why their work is not satisfactory.

Repairs of small cuts and the like that only affect the rubber and not the fabric of the tire are comparatively easy to make, but when it comes to repairing damage that extends clear through the carcass of the casing or even only partly so, many repairmen fail to appreciate the necessity of replacing the fabric that is concerned by the injury. They cement a patch on the inside, fill up the hole in the rubber and think they have done a good job. The result is that the fabric bulges more or less at the point where the threads have been cut. This places undue strain on the other threads surrounding the damaged point and causes excessive "hinging," which in a short time breaks the threads and causes the tire to blow out to an extent that often renders it useless for further service. Blow out patches, which, particularly on large tires, are only fit for temporary repairs, cause the same difficulty in prolonged service.

A repair is useless on some makes of tires that do not offer proper foundation for it. In other words, there are tires in the market that are not worth a repair, even when they are new, for the repair work will cause the cheap materials to lose what little strength they have. There are tires which are worth repairing if they have not covered a large mileage, but the same tires after they have covered 3,000 or 4,000 miles are usually not worth fixing. There are still other tires which contain such good materials and are so well built that where they have been given reasonable care while in use they are worth retreading.

Market for Manufactured Rubber Goods

NEW YORK, September 21, 1917.

There are two views that are current regarding the manufactured rubber goods trade, the one of the retailer, the other of the manufacturer and jobber. Underlying them both is seen a growing determination that untoward pessimism should not be tolerated. Just now the wholesale business is less active than usual at this time of the year; the retail business is expanding, and new phases of the financial outlook are developing. Markets have begun readjusting to new sets of conditions, and possibly the final readjustment will be postponed until after the new war loan is well under way.

MECHANICAL GOODS

A very moderate business is being done in mechanical goods, buyers being disposed to confine their purchases to small lots covering their immediate needs. Some business is being placed for next year but the general tendency is to take goods only as needed.

Nevertheless, optimism is growing among manufacturers as to the prospects for 1918. The salesmen on the road, notably in the West and Middle West, report satisfactory conditions.

SOLES AND HEELS

There is some slight improvement to report in the sole and heel trade. There have been sensational declines in the hide markets, followed by large sales and plenty of hides are said to remain in salt so that greater activity is expected in the boot and shoe manufacturing industry.

TIRES

As was expected, an upward tendency in tire prices has followed last week's lead taken by eight of the large makers.

The following is a list of the tire price increases that have occurred since September 1:

Advance—10 per cent on pneumatics.
Ajax—10 per cent on pneumatics.
Batavia—No increase announced—probably October 15.
Bergougnan—Will increase pneumatics 11 per cent on October 1.
Braender—10 per cent on pneumatics.
Century—No increase announced.
Continental—10 per cent on pneumatics.
Dayton—No increase announced.
Delion—10 per cent on pneumatics.
Diamond—15 per cent on pneumatics.
Dreadnaught—10 per cent on pneumatics; 10 per cent on tubes.
Dunlop—No increase announced.
Empire—10 per cent on pneumatics.
Falls—10 per cent on pneumatics.
Federal—10 per cent on pneumatics.
Firestone—10 per cent on pneumatics; 15 per cent on solids.
Fisk—10 per cent on pneumatics.
Globe—No increase announced—probably October 1.
Goodrich—10 per cent on both fabric and cord tires.
Goodyear—10 per cent on fabrics; 5 per cent on cords; 15 per cent on solids.
Gordon—10 per cent on pneumatics up to and including 4½ in. only.
Hardman—No increase announced.
Hood—12 to 15 per cent on solids.
Howe—5 per cent on red tubes; 7½ per cent (approx.) on gray tubes.
Indiana—No increase announced.
Kelly-Springfield—No increase announced.
Keystone—No increase announced.
Lancaster—No increase announced.
Lee—No increase announced.
Marathon—Decreased 10 per cent on pneumatics.
Mason—10 per cent on non-skid treads; 15 per cent on plain treads; 10 per cent on tubes.
McLean—10 per cent on pneumatics.
McCreary—No increase announced.
McGraw—10 per cent on both fabric and cord tires.
McNaull—No increase announced.
Michelin—10 per cent on pneumatics; 7 per cent on tubes.
Miller—10 per cent on all pneumatics except 5 in. size, on which there was no increase.
Mohawk—11 per cent on pneumatics.
Norwalk—10 per cent on 3 and 3½ in. pneumatics; 5 per cent on 4 in. only.
Pennsylvania—No increase announced.
Perfection—No increase announced.
Polack—10 to 15 per cent on solids.
Portage—10 per cent on pneumatics.
Quaker—No increase announced.
Racine—10 to 15 per cent on pneumatics.
Republic—10 per cent on pneumatics; 15 per cent on solids.
Rubber Products—No increase announced.
Speedway—10 to 15 per cent on pneumatics.
Star—14 to 18 per cent on pneumatics.
Sterling—15 per cent on pneumatics.
Swinehart—10 per cent on pneumatics; 10 per cent on solids.
Ten Broeck—No increase announced.
Tyre—10 per cent on pneumatics.
United States—10 per cent on pneumatics.
Victor—10 per cent on pneumatics.

A few of the prominent tires still remain unchanged in prices, such are Kelly-Springfield, Globe, Pennsylvania and Lee.

Opinions vary as to the effect these increases will have upon tire consumption. Some believe that after a few weeks' hesitancy users will buy tires as needed, others predict that as soon as winter weather sets in there will be fewer cars kept in service than last year. The chances are, however, that the bulk of motorists will continue to use their cars practically as usual.

DRUGGISTS' SUNDRIES

The druggists' sundries season is probably more backward than ever before in its history. Jobbers and retailers are buying merely to meet current needs. Some say they would place very large orders if the goods were offered to them at approximately 15 per cent less than it now costs to produce them, but there is little outside of hand-to-mouth purchasing at current prices.

There are, however, evidences on every order that business will soon show improvement, and most druggists' sundries people expect to see more active business as soon as the next war loan gets well under way and matters become more settled.

FOOTWEAR

Rubber footwear factories are working steadily but are feeling as much labor shortage as ever. Unless more women than have been employed in recent years can be induced to go into the factories the difficulty of the labor problem will grow with the coming of cold weather. Night operating is being continued by some concerns but most of them have not sufficient help to work with double shifts.

The Fabric Market

NEW YORK, Sept. 21, 1917.

The cotton market, as far as it is governed by crop expectations, has been under conflicting influences, a private condition report showing 4½ per cent deterioration in two weeks having been followed by a weekly report that was construed as rather favorable.

Pressing demand and slow crop movement postpone considerations affecting the ultimate value of cotton. Ultimately the problem of the right price will probably be worked out largely by the 2,000,000 growers, 25,000 ginners, 900 cotton seed mills, 3,200 storage places and 2,100 cotton consuming establishments. In addition there are numerous transportation companies, local buyers, merchants and others who handle more or less cotton during the season. Of course the foreign trade will have something to say. But they all collaborate to the same end, the fixing of the price of cotton under the natural law of supply and demand.

AMERICAN CONSUMPTION AND SUPPLIES ON HAND

The amount of cotton consumed in the United States during August, 1917, according to preliminary statistics compiled by the Bureau of the Census, was 569,351 running bales (counting round as half bales), compared with 557,780 bales in the corresponding month of 1916. The quantity for the year ended July 31, 1917, was 6,788,505 bales, compared with 6,397,613 bales for the preceding year. The amount of cotton on hand August 31 in consuming establishments was 1,178,803 bales, compared with 1,363,135 at the corresponding date last year, and the quantity in public storage and at compresses was 744,069 bales, compared with 971,578 in the preceding year.

The monthly figures include 21,623 bales of foreign and 8,270 bales of sea-island consumed, 86,069 bales of foreign and 30,905 bales of sea-island held in consuming establishments, and 37,882 bales of foreign and 17,552 bales of sea-island held in public storage.

Linters not included were 78,969 bales consumed during August in 1917 and 72,118 bales in 1916, 114,065 bales on hand in consuming establishments on Aug. 31, 1917, and 81,709 in 1916, and 174,641 bales in public storage and at compresses in 1917 and 75,465 in 1916. Linters consumed during 12 months ending July 31 amounted to 869,702 bales in 1917 and 880,916 in 1916.

EGYPTIAN COTTON

Advice by mail from Alexandria, under date of Aug. 4, shows that climatic conditions during July were favorable to the cotton plant.

The appearance of the plant was satisfactory; flowering was abundant and the delay mentioned in former reports has been regained. There are in general more flowers and bolls than last year.

The necessary measures have been taken to destroy the eggs of the leaf worm which appeared in fairly large quantities.

The presence of the boll worm and the pink boll worm has been reported in all districts, the latter in greater numbers this year than at the corresponding period last year. The supply of water for irrigation is abundant.

It is reported from a reliable source that the Egyptian Government has decided in principle to revert to a curtailment of the cotton acreage as it did in 1915, which order was, however, revoked in 1916. The intention is to reduce the acreage by one-third and have grain planted so as to make the country self-supporting. This should have an influence on the price

of Sea Island and Mississippi extra staple cotton.

SEA ISLAND

It is not yet possible to quote the Sea Island cotton market accurately, as there have been practically no transactions in Savannah. It is reported that if sellers would take 66 cents first cost at that place, a few bales could be sold, but they are not willing to come down to this price for the little they have to sell.

Prices in the interior are very irregular. Holders there do not yet have a sufficient lot of cotton on their hands to make them willing to sell at reasonable prices.

The Ginners' Report makes the amount of cotton ginned up to Sept. 1, 2,890 bales, against 4,131, in 1916; 2,099 bales, in 1915; 1,748, in 1914; and 436, in 1913.

There continues to be serious reports regarding the amount of damage done by the boll weevil and experts cannot see how the crop can amount to 100,000 bales.

One of the principal difficulties that will be contended with this year will be the scarcity of freight. Steamship companies have adopted the "first come, first served" policy and it will, therefore, be difficult to do business in forward shipments.

YARNS

Cotton yarn prices have again weakened on most numbers, though dealers say the mills will not accept business on the basis on which yarns are quoted in the Philadelphia market. Manufacturers insist that yarns should be lower, mentioning in this connection the lack of demand for yarns and the decline in cotton.

Worsted yarn mills are generally well sold ahead through the year and into the next one and do not appear to be concerned about new business. Yarn houses report that they would be at a loss to know where to get yarn if wanted for reasonably early delivery in quantity. They are, therefore, making no effort to push business.

FABRICS

Cotton goods markets are slightly more steady. The attitude of manufacturers does not lend encouragement to the views that have been current here of the probability of much lower fabric prices in the near future. Many of them express the opinion that goods will not follow cotton downward as rapidly as some of the resales in the market would lead to believe. The mill men say production is short of capacity, due to labor conditions and will continue short for some time.

The orders in hand are sufficient to take care of goods coming from the looms this month and next and the lower prices at which small quantities of goods can be bought in second-hands probably reflect a money condition in trade which is not likely to be permanent. Some mill men say that cotton fabric prices will be lower in the next six weeks than any prices that will obtain while the war lasts.

TIRE FABRICS

The tire fabric situation has not changed materially since our last report. The mills say that they have on their books all the orders that their looms can fill and are holding to their prices.

The shortage of tire fabrics that could have been feared some time back apparently is not likely to occur owing to the curtailment in the production of some of the large tire factories.

The high price of Sea Island and Egyptian cottons has caused some tire manufacturers to hastily adopt fabrics made of other staples. Some of these were fairly successful, others were not. However, the supply of tire fabrics for the coming season appears to be adequate.

HOSE AND BELTING FABRICS

There has been a decrease in the price of mechanical ducks, but mill men are not pushing sales; in fact, some are said to be refusing orders, their quotations being nominal.

There continues to be apprehension as to the supply of mechanical ducks for next year.

DRILLS, OSNABURGS AND SHEETINGS

Concessions are being made on some of the heavy brown sheetings where late deliveries are acceptable, but these concessions do not appear to count with buyers, as in most cases it hardly amounts to 6 per cent. Mills appear to be indifferent to influences exerted by cotton futures.

The large mill agents controlling standard goods appear to be able to sell any small lots that come to hand without making concessions.

GARMENT CLOTHS

A seasonable quiet prevails in the wholesale woolen market, the initial spring business is over with, repeat orders for fall have not been heavy, and it is too early to talk next year's fall business. The general disposition of selling agencies is to keep business under control. The raw wool market is not likely to become speculative and the costs of production will certainly not be lower for some time. Prices now current will curtail sales and are doing so beyond question. Government demands are very large and are likely to more than compensate for the loss of civilian trade.

BURLAPS

The burlap market is quiet but strong, with indications of a continuance of the advancing tendency. Numerous inquiries are disclosed and are met with conservative offerings. Buyers are still slow to support a sharp advance, but they are taking what they can get at market levels. Offerings for future tend to gain a premium over spots. Holders of goods seem to be content to let the market rest and many of them feel that the next trading basis will be higher than the one now quoted.

NEW YORK QUOTATIONS

TIRE FABRICS.

17¼-ounce Sea Island, combed, sq. yd.	$1.60@1.70
17¼-ounce Egyptian, combed	1.40@1.45
17¼-ounce Egyptian, carded	1.30@1.35
17¼-ounce Peelers, carded	0.80@0.90
17¼-ounce Peelers, combed	1.00@1.05
American Carded Staple, 12 to 20 yard, per lb. (pound basis)	.55
American Carded Staple, 8 to 10 yard, per lb. (pound basis)	.52

MECHANICAL DUCKS

Hose (spot) lb.	.52
Hose (future)	.51
Belting (spot)	.51
Belting (future)	.51

DUCKS

Single Filling (pound basis) lb.	.48
Double Filling (pound basis)	.52

DRILLS

37-inch 2.35-yard yd.	.17½
37-inch 2.75-yard	.15½
37-inch 3.00-yard	.15
37-inch 3.25-yard	.14
37-inch 3.50-yard	.13
37-inch 3.95-yard	.12
38-inch 2.00-yard Southern lb.	.45
38-inch 2.00-yard Northern	.48
40-inch 2.47-yard Southern yd.	.18¼
40-inch 2.47-yard Northern	.20
52-inch 1.90-yard Southern	.26½
52-inch 1.90-yard Northern	.27⅝
52-inch 1.95-yard Southern	.26
52-inch 1.95-yard Northern	.27
60-inch 1.52-yard Southern	.32
60-inch 1.52-yard Northern	.32¾

SHEETINGS

40-inch 2.35-yard yd.	.18
40-inch 2.50-yard	.16
40-inch 2.85-yard	.15
40-inch 3.00-yard	.14⅞
40-inch 3.25-yard	.13
40-inch 3.60-yard	.12⅝
40-inch 3.75-yard	.10⅜
40-inch 4.25-yard	.9½
38-inch Jacket Cloths linear yd.	.17@.18

TWILLS FOR PROOFING

37-inch 2.85-yard yd	.16
37-inch 2.35-yard	.19
37-inch 2.10-yard	.22

COTTON STOCKINETTES (52-inch.)

E—11½-ounce yd.	.75
A—11 -ounce	.50

BURLAPS

(Spot Carload lots.)

40-inch 7½-ounce per 100 yards	$10.75
40-inch 8 -ounce	11.00
40-inch 10 -ounce	14.80
40-inch 10½-ounce	15.40

Chemicals and Compounding Materials

NEW YORK, September 20, 1917.

The feature in the market for chemicals and compounding materials was the announcement made by the leading producer of zinc oxide to the effect that its output of "horsehead" brand zinc for delivery over the first half of next year would be restricted for use by the rubber trade only. This step was made necessary through the unusual conditions prevailing in this industry, the production being insufficient for meeting the demands of all the trades. Caustic soda continued to move upwards, new high record levels being established during the interval. Benzol was easier, producers lowering prices about 3c. per gallon. Sulphurets ruled firm, producers being well sold ahead and the imported grades are also in scanty supply on the spot. Sulphur was strong, but quotably unchanged. There was no important change in the dry color market.

ANTIMONY

The easier position of the metal failed to bring out any pressure on the part of sellers of sulphurets. Stocks on hand are moderate and some handlers report that they have little to offer for shipment over the remainder of the year. Quotations were repeated on the basis of 25 @ 26c. per pound for the red, 28 @ 30c. for the golden and 52 @ 55c. for the crimson.

BENZOL

Producers lowered prices 3c. per gallon, establishing the market at 52 @ 57c. per gallon for spot business, and 50 @ 55c. on contract. There was a good inquiry for benzol, sales of upwards of 200,000 gallons being reported for the last fortnight. The supply on hand, however, is ample for all purposes, and the undertone of the market remains barely steady.

DRY COLORS

Weakness in quicksilver brought out an easier feeling in the market for vermilion, although prices for the color underwent little change, sellers asking from $1.90 to $2 per pound. Ultramarine blues held at 25 @ 42c. per pound, according to quality. Blacks were in good demand, but with stocks light, quotations were more or less nominal.

LEAD PIGMENTS

An easier market was reported for pig lead, which brought out an easier feeling for the pigments. Up to the close, however, producers held out for 11 @ 11½c. per pound for dry white lead, basic sulphate. Lithopone was steady at 6½ @ 7c. per pound.

ZINC PIGMENTS

Producers announced a new policy for dealing in the ordinary American process zinc oxide. The rubber trade will be given preference in purchases covering 1918 business. The contract price for American process zinc for delivery over the remainder of 1917 was nominally unchanged at 10¼c. per pound, in 50-ton lots. French process zinc oxide for delivery over the remainder of 1917 (last quarter) was lowered in price to the extent of 1c. per pound, making the new trading basis 14c. for the red seal.

CAUSTIC SODA

Spot supplies are light and in firm hands. The market advanced to 10 @ 10¼c. per pound. The quotation at the close was wholly nominal.

SULPHUR

Refiners report a strong, but unchanged market. Supplies are scanty, in view of the sold-up condition of the market. Refined sulphur was held on the basis of $3.85 per cwt. for the flour, in car lots. Crude sulphur was nominally quoted at $37.50 per ton, f.o.b. mines.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone	lb.	.35	@	.36
Acids, Acetic, 28%	lb.	.05¼	@	.05½
Carbolic, C. P.	lb.	.42	@	.43
Cresylic, 95%	gal.	1.05	@	1.10
Muriatic, 20 deg.	lb.	.01¾	@	.02
Muriatic, 22 deg.	lb.	.02	@	.02¼
Nitric, 38 deg.	lb.	.07¾	@	.08
Nitric, 40 deg.	lb.	.08	@	.08¼
Sulphuric, 60 deg.	lb.	.01¼	@	.01½
Tartaric, crystals	lb.	.78½	@	—
Aluminum Flake	ton	22.00	@	24.00
Aniline oil	lb.	.28	@	.30
Antimony, metal, spot	lb.	.18	@	—
Oxide	lb.	.16	@	.18
Sulphuret, red.	lb.	.25	@	.26
Sulphuret, golden.	lb.	.28	@	.30
Sulphuret, crimson	lb.	.52	@	.55
Asbestos	ton	40.00	@	60.00
Asphaltum, Egyptian	lb.	.20	@	.25
Domestic	ton	18.00	@	25.00
Barium sulphate, technical	lb.	.04½	@	.05
Chloride	lb.	.05	@	.05½
Barytes, prime white imported	ton	38.00	@	40.00
white, domestic.	ton	28.00	@	32.00
off color, domestic.	ton	18.00	@	22.00
Benzol, pure	gal.	.52	@	.57
Beta-naphthal, sublimed.	lb.	.80	@	.85
unsublimed	lb.	.65	@	.70
Blacks, Drop	lb.	.07	@	.12
Ivory	lb.	.16	@	.30
Carbon gas	lb.	.27	@	.35
Lampblack R. M.	lb.	.04½	@	.06
Mineral blacks	ton	24.00	@	28.00
Blues, Prussian	lb.	.75	@	1.45
Soluble	lb.	1.45	@	1.75
Ultramarine	lb.	.25	@	.42
Browns, Umber, Turkey, burnt, powdered	lb.	.04	@	.05
American, burnt.	lb.	.03	@	.03½
Cadmium sulphide, yellow.	lb.	2.25	@	2.50
Carbon bisulphide, bulk.	lb.	.07	@	.07¾
tetrachloride, drums.	lb.	.16½	@	.17
Caustic Soda, 76@78%	lb.	.10	@	.10¼
Chalk, precipitated, light.	lb.	.04½	@	.04¾
heavy	lb.	.03¾	@	.04¼
China clay, domestic	ton	18.00	@	22.00
imported	ton	25.00	@	35.00
Fossil flour	lb.	.06	@	.10
Gilsonite	ton	42.00	@	46.00
Glue, extra white	lb.	*.28	@	.38
medium	lb.	*.25	@	.28
low grade		*.22	@	.25
Glycerine, C. P. (drums)	lb.	.64	@	.65
Graphite, flake (bbl.)	lb.	.25	@	—
powdered (bbl.)	lb.	.10	@	—
Green, chrome, R. M.	lb.	.12	@	.30
Ground glass (fine)	lb.	.02½	@	—
Hexamethylene	lb.	.75	@	.80
Infusorial earth, powd'd.	ton	60.00	@	—
bolted	ton	70.00	@	—
Iron oxide, red, reduced grades	lb.	.04	@	.05
red, pure, bright.	lb.	.12	@	.14
Lead, red oxide of	lb.	.13	@	.13½
sublimed blue	lb.	.11	@	.11½
white, basic carbonate.	lb.	.11½	@	.12
white, basic sulphate.	lb.	.11	@	.11½
Lime flour	lb.	.01½	@	.01¾
Litharge	lb.	.12½	@	.13
English	lb.	*.13	@	.14
sublimed	lb.	.12¼	@	.12½
Lithopone, domestic	lb.	.06½	@	.07
Magnesia, carbonate	lb.	.11	@	.13
calcined, heavy	lb.	.10½	@	.11
calcined, light	lb.	.70	@	.75
Magnesite, calcined, pwd.	ton	65.00	@	70.00
Mica, powdered	lb.	.03¾	@	.05
Mineral rubber (asphaltum base)	ton	40.00	@	60.00
Naphtha, motor gasoline, (steel bbls.)	gal.	.24	@	—
68 @ 70 degrees (steel bbls.)	gal.	.30	@	—
70 @ 72 degrees (steel bbls.)	gal.	.31	@	—
73 @ 76 degrees (steel bbls.)	gal.	.33	@	—
machine (wood bbls.)	gal	.41	@	—
Oil corn, crude	cwt.	*15.45	@	15.65
corn, refined	cwt.	16.46	@	16.51
linseed (bbl.)	gal.	1.20	@	—
palm, Lagos	lb.	.18½	@	—
pine, yellow	gal.	.54	@	.56
rapeseed, refined	gal.	*1.50	@	1.55
rapeseed, blown	gal.	*1.60	@	—
rosin, first rectified.	gal.	.35	@	.36
tar (commercial)	gal.	.27	@	.28
Orange mineral, American.	lb.	.15	@	.15½
imported	lb.	.16	@	.20
Petrolatum, bbls., amber.	lb.	.04¾	@	.05
pale yellow	lb.	.05	@	.05⅛
Pine, tar	bbl.	15.00	@	15.50
Pitch	bbl.	4.25	@	4.75
Plaster of paris	bbl.	2.00	@	2.50
Red, Tuscan	lb.	.28	@	.31
Indian (reduced)	lb.	.06	@	.08
Standard	lb.	.08	@	.11
Rosin (common to good), @ 280 lbs.	bbl.	6.00	@	6.50
Rotten stone, powdered.	lb.	.02¾	@	.04¼
Rubber substitute, Black.	lb.	.11	@	.13
white	lb.	.15	@	.18
brown	lb.	.14	@	.15
Shellac, fine orange	lb.	.61	@	.62
T N	lb.	.55	@	.56
Bleached, commercial.	lb.	.53	@	.54
Bleached, bone dry.	lb.	.65	@	.66
Silex (silica)	ton	24.00	@	34.00
Soapstone, Powdered,	ton	14.00	@	20.00
Starch, corn, powdered.	lb.	.06⅜	@	.06½
Sulphur, crude	ton	*45.00	@	50.00
roll, per 100 lbs. in	bbls.	3.70	@	4.15
flour		3.85	@	4.40
flowers		4.05	@	4.60
commercial		3.35	@	3.50
Talc, American	ton	10.00	@	15.00
French	ton	20.00	@	24.00
Toluol, pure, in drums.	gal.	*1.75	@	2.00
Tripolite earth	ton	60.00	@	65.00
Turpentine, pure gum— spirits	gal.	.44	@	.45
wood	gal.	.38	@	.40
Venice, artificial.	gal.	.12	@	.13
Vermilion, English	lb.	1.90	@	2.10
Wax, beeswax, crude yel.	lb.	.44	@	.45
ceresin, white	lb.	.18	@	.22
carnauba, No. 3	lb.	.40	@	.41
Montan	lb.	*.35	@	.40
oxokerite, black	lb.	.75	@	.80
oxokerite, yellow.	lb.	.70	@	.75
Paraffin, refined, 118/120 M.P. (bbls.)	lb.	.10	@	.10¼
123/125 M.P.	lb.	.10½	@	.10¾
128/130 M.P.	lb.	.10¾	@	.11
133/136 M.P.	lb.	.12	@	.12¼
Crude, 117/118 M.P.	lb.	.07¾	@	.08
124/126 M.P.	lb.	.08¼	@	.08½
Whiting, commercial	cwt.	.95	@	1.10
Paris, white, American	cwt.	1.25	@	—
English cliffstone.	cwt.	1.50	@	—
Yellow chrome	lb.	.24	@	.27
Zinc oxide, American process, horsehead brand.	lb.	†.10¼	@	.10½
selected	lb.	†.10¾	@	.11
"XX red"	lb.	†.10¼	@	.10½
French process, green seal	lb.	†.14½	@	.14⅝
red seal	lb.	†.14	@	.14⅛
white seal	lb.	†.15	@	.15⅛
Zinc substitutes	ton	30.00	@	35.00
Zinc sulphide, pure	lb.	.07¼	@	.07¾

*Nominal. †Contract prices.

The Crude Rubber Market

NEW YORK, September 20, 1917.

During the last fortnight there was little if any change in general conditions and the market for crude rubber was subjected to only moderate price fluctuations. While the situation in London was firmer, caused by the less favorable shipping situation, the undertone here was easier, as it was possible to obtain supplies of the gum via Pacific ports without much delay. Spot and nearby quotations were actually lower than the distant positions, as speculators were not disposed to discount the market on account of the many uncertainties confronting the trade.

Advices from London indicate that there has been more animation on the part of speculators. Arrivals have been smaller, due to the extremely tight shipping situation, with the result that holders of rubber have not been free sellers. The market today closed firm at 33½d. per pound for first latex pale crepe, spot delivery. Futures commanded a premium, October-December closing at 34½d. and January-March at 35¼d. Smoked sheets, ribbed, on spot, closed at 31¾d., with October-January at 32¾d. and January-March at 33½d. The strength in futures was the feature in the market.

The New York market was irregular with the undertone barely steady in spite of firm cables from London. The fact that importers and manufacturers here have had no great difficulty in obtaining rubber from the East brought out easier prices. The entire market closed about 1c. per pound lower than a fortnight ago.

First latex pale crepe for spot delivery was quoted at 67c. per pound. Some sellers were willing to shade this price at least ½c., but this failed to attract buyers. Most of the consumers appeared to be well covered so far as 1917 wants were concerned.

Standard crepe for shipment over the first half of 1918 was offered on the nominal basis of 67½c. per pound. Ribbed smoked sheets for spot and nearby delivery closed at 66c., with the distant position steady at 66½c. per pound.

Para descriptions went off from ½ to 1c. per pound in a quiet market. Up-river fine was offered at 68c., spot delivery, and 67c. for October-December delivery. Up-river coarse closed at 47 @ 48c. per pound. Caucho ball settled at 41 @ 41½c. per pound.

Centrals also were inactive with closing prices slightly lower. Corinto was traded in at prices ranging from 41 to 41½c. per pound, which prices represented the nominal market towards the close. Esmeralda held at 40 @ 40½c. per pound. Guayule gum was inactive at 32 @ 33c. per pound. Pontianak gum was available at 11½c., with Pelembang at 12c. nominal.

	Spot.	Oct.-Dec.	Jan.-Mar.
Para—Up-river fine	68	67	..
Up-river medium	62	61	..
Up-river coarse	48	47	..
Caucho ball	41	41	..
Islands fine	58	58	..
Islands coarse	29½	29½	..
Cameta	31	31	..
Madeira fine	70	..	..
Ceylons-Smoked sheets, ribbed.	66	66	66½
Smokers sheets, plain	65	65	65
First latex pale crepe	67	67	67½
Amber crepe	62½	62½	63
Clean brown crepe	60½	60½	61
Centrals—Corinto, prime	41	41	..
Esmeralda, prime	40	40	..
Mexican scrap	39½	..	..
Balata, sheets	54	..	..
Balata, block	50	..	..
Guayule	32	32	..
Africans—Rio Nunez, string.	*67	..	..
Massai, red	*55	..	..
East Indian Pontianak	11½	..	..
Palembang	12	..	..

* Nominal.

Scrap Rubber

NEW YORK, Sept. 20, 1917.

There is nothing in the scrap rubber market that calls for extended comment.

The following prices were paid for scrap rubber delivered at the reclaiming mill:

Boots and shoes	9⅝ @ 9¾
Arctics, trimmed	7⅝ @ 7¾
Arctics, untrimmed	6¾
Tires—Automobiles	6¾ @ 6⅞
Bicycles, pneumatic	5½
Mixed hose	2¼ @ 2½
Air brake	5½
Inner tubes, No. 1	25½ @26
Inner tubes, No. 2	13¼
Inner Tubes, red	13 @13¼

Importations of Crude Rubber Into the United States in August, 1917

Figures compiled by The Rubber Association of America, Inc., 17 Battery Place, New York City
(Estimated net weights)

PLANTATIONS

From	*Tons*
Liverpool	15
London	1,887
Sydney	2
Singapore	8,163
Colombo	619
Penang	668
Batavia	3,424
Japan*	380
	15,158

*And other countries.

PARAS

Iquitos	525
Manaos	250
Para	985
	1,760

AFRICANS

From	*Tons*
Liverpool	15
Hull	28
Bordeaux	65
	108

**CENTRALS AND GUAYULE

**Note—Owing to the war, it is temporarily impossible to furnish complete statistics for rubber arriving on boats from Central America.

Centrals (Mexico and Central America)	23
Guayule (Mexico)	194
	217

MANICOBAS AND MATTO GROSSO

Bahia	19
Orinoco	28
	47

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons		*Tons*
Scrap Rubber	455	Gutta Percha	3
Reclaimed Rubber	39	Balata	22
Gum Dumar	113	Gum Copal	54

COMPARISON 1916–1917

	August 1916	*August* 1917
Plantations	5,247	15,158
Paras	639	1,760
Africans	149	108
Manicoba and Matto Grosso	19	47
Centrals	178	23
Guayule	....	194
	6,252	17,290

Arrivals Plantation Rubber for August, 1917, Showing Ports of Origin and Destination

From	*Arrived at*	*Tons*
Singapore	Seattle	4,055
Singapore	Port of Cleveland	1,057
Singapore	San Francisco	1,088
Singapore	New York	1,963
Penang	Seattle	610
Penang	San Francisco	58
Batavia	New York	707
Batavia	San Francisco	2,717
London	New York	1,799
London	Boston	88
Liverpool	Boston	15
*Japan	Seattle	380
Colombo	New York	607
Colombo	San Francisco	12
Sydney	San Francisco	2
		15,158

*Including other countries.

Arrivals of Plantations by Ports

Atlantic Ports—			
New York	5,076		
Boston	103		
		5,179	
Pacific Ports—			
San Francisco	3,877		
Seattle	5,045		
		8,922	
			14,101
Port of Cleveland			1,057
			15,158

Swinehart Ideal Cellular Tires

Proper tire equipment for motor trucks has received considerable attention for the reason that 50 per cent of truck troubles are due to tires.

The Swinehart Tire & Rubber Co., Akron, Ohio, has been particularly successful in developing a type of cushion tire, which has demonstrated its advantages in everyday service under widely varying conditions.

This tire is of cellular construction, having cells placed perpendicularly throughout its entire circumference. These cells play an important part in the success of the tire.

First of all, the internal friction is reduced to a minimum. The road wave is almost wholly absorbed in the cells or

CROSS SECTION OF THE SWINEHART IDEAL CELLULAR TIRE

holes, there being numerous points, all on the surface of the tire, where displacement of rubber or road wave may be absorbed. This eliminates all danger of base separation and the cells allow the escape of heat which may be generated by fast driving, or climatic, and road conditions.

Vibration is the enemy of all machinery and this is why rubber tires are used to absorb vibration and protect the truck's mechanism. The cellular construction provides resiliency, which is the nearest approach possible to a pneumatic tire.

Another demand on rubber tires is traction, or road grip; that is, the ability to move the truck without skidding or spinning. This also is a highly developed feature of the Swinehart cellular tire, which is said to hold the road even when covered with mud or hard packed snow or ice, without the necessity of using skid chains.

Penang Exports of Rubber to United States

The direct exports of rubber to the United States from Penang, Straits Settlements, during the three months ended June 30, 1917, increased considerably over the corresponding period in 1916, according to invoices certified at the Penang consular agency. While 2,495,920 pounds of rubber, valued at $1,583,200, were exported to the United States during April, May, and June, 1916, the exports during the corresponding period of 1917 amounted to 5,702,838 pounds, valued at $3,600,539. This shows an increase of 128 per cent in weight and 127 per cent in value, indicating practically the same level of prices for the two periods.

The figures for the half year, January to June, 1916, were 4,378,377 pounds, valued at $2,767,450, as compared with 10,006,409 pounds, valued at $6,088,020, for the first half of 1917.

New Method of Gasoline Extraction

The motorist has more recently felt the results of the rising costs of tires and accessories, but has long been used to the high price of gasoline. Now, when the country's need of gasoline threatens to further increase the price, a new means for obtaining it is of the greatest importance to both motorists and rubber manufacturers.

The Bureau of Mines has recently issued Bulletin 120 which shows how an additional supply of gasoline may be obtained from what was heretofore a waste and a source of expense.

The extraction of gasoline from natural gas by compression and condensation has been an important and rapidly growing industry in recent years. In 1915 about 65,000,000 gallons were produced by such methods, while in 1916 the estimated production was 100,000,000 gallons.

This gasoline is of doubled importance in that it can be blended with naphthas otherwise unsatisfactory for use in the automobile, and made into an acceptable motor spirit.

The absorption process is quite different from the older compression process and heretofore has not been described in literature.

It is a method only recently commercially applied to natural gas, yielding the same quality of gasoline and capable of being applied under conditions where the older process could not be employed profitably. By it the gasoline in natural gas, though extremely lean, can be absorbed in oil, from which it is separated by distillation.

Natural gases yielding less than 1 pint of gasoline from each thousand cubic feet of the gas have been treated with commercial success, where formerly this gasoline had gone to waste and had constituted a source of much trouble and expense in the pipe lines.

In view of the present needs of gasoline for war and industrial purposes, this additional quantity of gasoline, heretofore a waste and source of expense, is of tremendous importance and may be considered as an excellent illustration of the results the Bureau of Mines is obtaining in its investigations for reducing wastes and increasing efficiency in the petroleum industry.

Bulletin 120 treats fully the underlying principles of the absorption process, as well as the methods for testing natural gases for gasoline, the construction and operation of absorption plants, and records the results obtained by several plants of demonstrated commercial success.

While so far restricted in commercial use to the treatment of large volumes of gases too lean for profitable treatment by compression, it is not thought to be limited to that field but is believed to be capable of extension into conditions where compressors are now being employed.

New Trade Paper Established

A new daily trade paper entered the field on September 24. The publication is called *The Chemical, Color and Oil Daily*, and specializes on market reports and general market information. The paper is designed to serve purchasing agents of manufacturing plants. It presents a very attractive appearance and promises to attain a high place among trade journals. Included in the reports is a concise review of the rubber market, as well as the chemicals and compounding materials used in this industry. It is published by The Trades Reporting Bureau of 154 Nassau street, New York.

TIRE NEWS

Irvin Method of Repairing Inner Tubes

The defects of the ordinary "patch" method of repairing punctures or other ruptures of pneumatic tire tubes are well known to experts, and numerous attempts to overcome them have met with more or less success.

J. C. Irvin, of 254 West 54th street, New York City, has discovered an improved method by which these defects are overcome, which method enables repairs to be made more cheaply and with practically absolute security, without the use of a patch or reinforcement such as is ordinarily employed.

THE BLOW-OUT

The Irvin method is briefly as follows: As a preparatory step a file, sandpaper or a buffing-wheel is used for cleaning and roughening the surfaces adjacent to the puncture or rupture. If the edges of the opening are considerably ragged or uneven they are uniformly trimmed and, preferably, beveled or skived in order to form a broader adhering surface.

The next step is to prepare for insertion in the opening formed by the rupture a piece of uncured rubber cut from a sheet having smooth parallel sides and of the same thickness as the injured tube.

This piece is cut in the same form and dimensions as the opening into which it is thereafter neatly fitted. Thus inserted the piece forms a

INSERTING REPAIR STOCK

smooth, flush surface on both sides. Carbon bisulphide is then applied to the raw edges of the rupture, which are thus prepared for application of a cement, which may be that commonly used by tube repairers.

When sufficiently dried, the parts treated as described are inserted in a vulcanizer between smooth, flat, and parallel dies or plates specially designed for the purpose. Vulcanization is carried to the usual degree in tube repairing, and the result is a tube having a uniform thickness or

VULCANIZING

parallel surfaces, or a smooth flush joint between the inserted piece and the adjacent edges of the rupture. In other words, a practically homogeneous union between the inserted piece and adjacent portions of the tube is produced, the joint having the same thickness, smoothness, elasticity, and durability as other portions of the tube where no puncture or rupture has occurred.

THE FINISHED JOB

In place of using uncured rubber, as above described, it is practicable to produce a good result by using a piece of soft vulcanized rubber cut out of a sheet having the same thickness as the tube at the point of rupture, and the balance of the operation is the same as already described.

The Irvin method of repairing punctures and blow-outs is equally well suited for splicing ends of inner tubes and has marked advantages over the usual practices.

With this method it has been demonstrated to be practicable to dispense with an inserted strip or piece, the skived or beveled ends of the tube being merely painted with carbon bisulphide and cement and brought into contact manually, then vulcanized, as before described.

In this splice, only the skived surfaces of the tube ends are lapped, and these need not be more than a half inch in width. A substantial saving of material is thus effected and the result is an endless tube of which the surfaces at the splice are parallel and of the same thickness as the tube. The splice is so well made as to be practically invisible.

Abnormal Wear of Solid Tires

One of the most common causes of abnormal wear of solid tires is where distinct flat sections develop upon the periphery.

In practically every instance where such flats appear upon tires, except rear ones which have developed flats through undue brake action, it is found that one flat portion extends diagonally across the tread, while the next is also similar, but worn in the opposite direction. Obviously, this peculiar manner of wear upon the tire cannot be a defect in its manufacture. This is proved by the way in which the tire is worn: the flats are symmetrical and equi-distant, indicating that something is wrong in the actual running of the wheel.

These equi-distant, symmetrical flats are due to the fact that the wheel in running has covered practically a zigzag track, which has produced a "buffing" action upon the tire. The seat of the trouble is in the wheel itself and a careful examination will disclose that a loose or worn bush has caused the wheel to turn in and out of track, and thus produced the flats.

Weak Felloes

Another cause for flats on solid tire treads are weak felloes, which allow a certain amount of spring on the portions between the spoke heads. In this way the tire is held up to its work opposite the spoke heads only, and will wear flat on these portions alone.

Bent Axles

An axle slightly bent backwards will cause a creeping or scrubbing motion between the tire and the road surface every few inches, the distance which the wheel runs straight being determined by the amount of movement it has on the axle and the slackness of the steering gear. In this case, the tire wears with a big line of demarcation running circumferentially around it. This indicates lateral sliding, which has been arrested by the crowding up of the rubber as clearly shown on the surface about the same distance across the tread of the tire throughout its whole circumference.

Overloading

The chief cause of solid rubber tire failure is overloading. Despite its resiliency, if overloaded, the rubber will split off in large pieces.

Overloading may be caused in different ways; for instance, by the sudden compression caused by a brick or curbstone. This sudden and severe strain is just as much overloading as the increase of the car's burden above the normal.

In truck wheels, the compression due to the load is transmitted by the spokes to the axle, and in some cases of overloading the greatest wear shows at spots between the spokes, due to the fact that the rim gives under the load at these points.

As the tire wears, the wheel develops an increasing tendency to push along these surfaces when starting and stopping instead of maintaining the true rolling motion.

Overloading and unequal loading will frequently cause the center of the axle to sag in its middle and wear the inside of the tire.

Undersized Tires

Overloading is very detrimental to tires, but there are two sides to the question. Is the vehicle overloaded or only the tires? Some machines designed to carry a certain load are fitted with tires of much too small sections. It is a mistake to use tires of the smallest section that possibly may be used for the work required. Wheels should always be fitted with tires of a section size that admits of possible overloading. It is cheaper in the end to have a truck "over-tired" than to have it "under-tired," for the extra cost of large section tires is far more than repaid by the saving of repairs to the chassis and avoidance of breakdowns caused by excessive vibration. Further, over-sized tires nearly always give extra mileage and better satisfaction.

Tire Dealers Can Attach Automobiles

It has recently been decided in Oregon that a tire dealer who puts on tires which he has sold is an automobile repairer, and, therefore, has a lien under the state provision which gives every repairman who has expended labor, skill and material at the request of the owner, reputed owner or authorized agent, a lien on the automobile for the contract price of the expenditures although he has surrendered possession of the car.

Suit was brought to foreclose a repairman's lien. It appeared that the dealer was engaged in the business of selling and repairing tires, and for that purpose kept qualified employes who removed old tires and put on new ones, and that when this was done the car would be left for a short time upon the street in front of the dealer's place of business where his employes raised the end of an axle, removed the bolts and pried the old tire from the retaining rim, scraped the rust off and attached and inflated the new tire.

These operations were performed several times for the car owner against whom the claim of lien was made for $115.45. It appeared that the owner's car had been sold by a corporation which had retained title to the car until the purchase price should be paid. The statute provides, among other things, that "every automobile repairer who has expended labor, skill and materials on any chattel at the request of its owner, reputed owner, or authorized agent of the owner, shall have a lien upon said chattel for the contract price for such expenditure—notwithstanding the fact that the possession of such chattel has been surrendered to the owner thereof."

The court held that the language of this statute was sufficient to give the dealer a lien on the car and that the lien came before the claim of the conditional seller—Courts vs. Clark, 164 Pacific Reporter, 174.

Truck Tires on Belgian Front

Capt. Gustave Van den Kerckhove of the Belgian army, and for four years preceding the war a member of the Advisory Committee of the London Rubber Exhibits, utilizes every spare moment to study the durability of automobile and truck tires. In a letter to W. A. Fuller, of the Foreign Truck Tire Sales Department of the B. F. Goodrich Co., Akron, Ohio, he details many interesting observations. He says in part:

"Particularly do I desire to upset the common belief that because of the horrid roadbeds and excessive use of motor cars and trucks the life of the tire abroad is unusually short. On the Nieuport, Furnes, Dixmude, Messines roads I have inspected tires, and to my utter astonishment learned that they had covered thousands of kilometers. Outwardly they showed little sign of great wear.

"Another thing: A verification of a general nature which evolves out of my inspection is that one of the greatest factors determining the endurance of a tire rests on the quality of the raw material used in its manufacture.

Goodrich Field Day, Akron, Ohio

Notes of Interest to the Tire Trade

Kelly-Springfield Declares Dividend—Hood Opens New Branch—Cornell Leaves Empire—Mason Makes New Sole—Munger Sues Firestone—Diamond Movie

Kelly-Springfield in New Quarters

The Kelly-Springfield Tire Co., New York, is now in its new quarters at Fifty-seventh street and Seventh avenue. The main floor of the new building is occupied as a store while the general offices are located on the two floors above.

H. W. Holcombe Buys Estate

The Hankinson estate of 250 acres with a large residence, at Eatontown, N. J., has been sold by Grant Parish of Asbury Park, N. J., for a client to H. W. Holcombe, president of the Robert Badenhop Rubber Co. The property was held at $35,000.

Rotary to Build

The Rotary Tire & Rubber Co. of Zanesville, Ohio, is planning the construction of a factory which is to cost about $500,000.

Kelly-Springfield Declares Dividend

The Kelly-Springfield Tire Co. has declared a quarterly dividend of $1.50 per share on its 6 per cent preferred stock, payable October 1, to stockholders of record September 17.

Pettengill Joins Medical Corps

H. Lawton Pettengill of the Dreadnaught Tire & Rubber Co., New York City, is soon to forsake Broadway to receive an appointment to the Army Medical Corps.

Hood Tire Co. Opens Branch

The Hood Tire Co., Inc., of Watertown, Mass., has opened a branch at Woodward and Palmer avenues, Detroit, Mich. Arthur E. Egan is office manager and Bernard F. Egan is sales manager.

F. H. Brand Now with Fulton Motor Co.

F. H. Brand, at one time auditor of the Diamond Rubber Co., but for the past four years auditor of the Simplex Automobile Co., has taken up his duties as auditor and efficiency expert with the Fulton Motor Truck Co., Farmingdale, N. Y.

Resigns Position with Empire

A. Boyd Cornell, secretary of the Empire Tire & Rubber Co., Trenton, N. J., has resigned his position, to the surprise of the rubber trade in general.

Mr. Cornell has been in the rubber business since 1901, when he was graduated from Princeton. He has had experience in all departments of the rubber industry and is one of the best known rubber men in this section.

H. R. Nason has succeeded Mr. Cornell as secretary.

Mason Makes Fibre Sole

A new fibre sole will soon be marketed by the Mason Tire & Rubber Co., Kent, Ohio. It is claimed that it has stood up remarkably well in the preliminary tests. The new sole will bear the trade name "Masola."

Bastian Joins Poertner

J. K. Bastian has joined the sales organization of the Poertner Motor Car Co., Inc., New York. He was previously connected with the Firestone Tire & Rubber Co.

Mason Opens Chicago Branch

The Mason Tire & Rubber Co., Kent, Ohio, has opened a branch in Chicago at 2120 Michigan Boulevard. It is said that this was necessary to take care of the company's increasing business in the Middle West and that no expense was spared to make it one of the most attractive tire salesrooms in Chicago.

D. Jeidell Joins Delion

David Jeidell has joined the Delion Tire & Rubber Co. and will be at the main office, 1922 Broadway, New York City.

Munger Sues Firestone

Louis de F. Munger has brought suit against the Firestone Tire & Rubber Co., Akron, Ohio, for back royalties amounting to $1,500,000 for alleged damages through having been unable to dispose of his patents on account of the Firestone rim.

The suit has been entered in the United States District Court and is the first to be brought as a result of the Court's decision against the Perlman Rim Corporation last June in Munger's claim of infringement on his patent No. 638,588 of December 5, 1899, covering a tapered rim fitting into a tapered felly.

"Diamond" Shows Rubber Movie

An educational and highly instructive moving picture entitled "The Romance of Rubber" was recently shown at the 57th Street Y. M. C. A., New York City, by The Diamond Rubber Co., Akron, Ohio. The picture, which was appreciated by a large audience, was presented under the direction of N. E. Oliver, Sales Manager.

Invitations were sent out to the trade in general and the purpose of the presentation was to bring the dealer and jobber closer to the manufacturer by showing how Diamond products are manufactured.

The scenes showed the history of rubber from the actual planting to the final manufacture into the finished article at the factory. This was done by dividing the picture into four reels. The first showed the growing of the rubber plants, the tapping of the trees, gathering and congulating of the latex, the washing and rolling into sheets and the packing for shipment.

The second reel pictured the inspection of fabric at the factory, followed by views of the physical and chemical laboratories. Following this was shown the washing drying, compounding, milling and calendering operations. Next was the making of wires and cables, batteries, fountain pens, mats and belting, with views of the vulcanizing rooms.

In the third reel was shown the making of various kinds of hose, bulbs, rubber bands, water bottles and tennis balls and the many inspections each article had to undergo.

The last reel explained the intricacies of the manufacture of automobile tires from the cutting of fabric through the building and curing operations. Scenes of the factory offices indicated on how vast a scale the various activities are carried forward. The large force of female and male stenographers, telephone switchboard, library, sales school, restaurants, rest rooms, dental offices and athletic field completed the interesting film.

News of the Dealers

Victor L. O. Edwin and Carl L. Johnson of the Johnson Auto Tire & Supply Co., Wichita, Kan., will erect a new building.

Hemming & Morris have leased the store at 1331 South Main street, Los Angeles, Cal., and installed a vulcanizing plant and complete stock of new and used tires.

L. O. Harvuot has purchased a half interest in the Interstate Double Tread Tire Co., 1714 South Main street, Los Angeles, Cal.

Harris Tire Co., Savannah, Ga., Stephen N. Harris, manager, has given up the handling of cars in order to devote itself exclusively to accessories.

Madison Tire & Service Co., 314 East Main street, Madison, Wis., has been appointed representative of the Pennsylvania vacuum cup tire.

Carl Fay and T. J. Traynor, Dodge City, Kan., have leased the garage of W. T. Hale & Son. W. & T. Hale & Son will keep the agency for Pullman tires.

Hoggett & Briggs, Chadron, Nebr., have taken possession of and moved into the Maxwell Garage. For the present the new firm will devote its time exclusively to repair work and the selling of tires and accessories.

The Highway All-Rubber Patch Co., St. Louis, Mo., which manufactures and sells a cold all-rubber patch which is held to be self-vulcanizing, has opened salesrooms at 2326 Olive street. J. S. Ellis is manager.

Reedy-Naddy Auto Supply Co. is the name of a new concern which has taken over the business of the Rogers Supply & Tire Co., Columbus, Ohio.

W. S. Wilkinson, formerly of Racine, Wis., has established a tire store and repair shop at 710 Pierce avenue, Marinette, Wis.

B. R. Colvard, Frankfort, Kan., has purchased the J. F. Tommer vulcanizing plant.

A. W. Hilding is to have charge of the Auto-Wau Vulcanizing & Tire Repair Co., Ottawa, Kan.

Western Motorcar Sales Co., Portland, Ore., has been appointed selling agent for Kelly-Springfield tires. T. A. Dunn has been put in charge of the tire department.

Clem M. Schauerte has been appointed sub-agent of the Independent Tire Co. of St. Louis, Mo., and will locate at 6 South High street, Belleville, Ill.

M. A. Lash, Concordia, Kan., has purchased the Waterstrat Tire Shop.

R. B. Miller and C. H. Ward, Olathe, Kan., have started a vulcanizing business.

L. G. VALIANT has opened a new automobile accessory store at 624 West 8th St., Longmont, Cal. The store will carry a complete line of accessories and will handle Marathon and Defiance tires. It will be known as the Auto Equipment Supply Co.

Classified Buyers' Index To Rubber Factory Equipment

Below is printed an alphabetical list of the principal machinery and other equipment used in rubber factories, compiled from information supplied by the manufacturers. The key symbols placed after the items refer to the names of the manufacturers that make them, as shown in the list of Manufacturers of Rubber Factory Equipment, that is printed elsewhere on this page.

Accumulators, A11, B23, F3, T31, W31.
Autoclaves, A11, B31, D15, E11, S55.

Balances, B7, E11, S19, T27.
Bins, Stock, O3.
Blocks, Pillow, A11, F3, T43.
Blowers, Tube Splicing, G3.
Boilers, Steam, S31.
Boosters and Exhausters, A3.
Boxes, Compound, O3.
Brands, Aluminum, D19.
Brakes, T43.
Brushes, O7.
Buckets, D27.

Cages, D27.
Calenders, A11, F3, S31, T43.
Calenders, Embossing, F3, H11, T19, T43.
Cars, Shoe, O3.
Carton Filling Machines, W23.
Carton Making Machines, W23.
Castings, A11, B3, B23, B31, D27, F3, M3, T31, T43, W31.
Chemical Apparatus, B31.
Chucks, S47.
Clutches, Brake, F3, T43.
Clutches, Friction, F3.
Clutches, Magnetic, F3, T43.
Compressors, Air, S31, T31.
Condensers, D15, S55, T31.
Conveyors, D27.
Cores, Tire, A11, B3, T31, J3.
Couplings, Power, T43.
Crackers, A11, F3, T43.
Cranes, D27.
Cutters, Baby Carriage Tire, W23.
Cutters, Band, A11, E3, H31, R7.
Cutters, Bias, W23.
Cutters, Duck Plug, W23.
Cutters, Gaskets, A11, H11, H31.
Cutters, Raw Stock, W23.
Cutters, Rubber Stock, H19, H31, R7, T11.
Cutters, Scrap, A3, T11.
Cutters, Strip, E3, F3.
Cutters, Tubing, W23.

Devulcanizers, B11, D15.
Dies, A11, D19, H11, D19.
Die Sinking, A11, D19, H11.
Dies, Cutting, D19, H11.
Digestors, D15.
Dipping Machines, O3.
Doubling Machines, F3, T43.
Doubling Machines, Fabric, T17.
Drills, D27.
Drives, A11, D27, F3, T43.
Drives, Chain, D27, F3, T43.
Drives, Motor, A11, D27, F3, T43.
Drums, Bead, A11, T31.
Drums, Tire Machine, G3.
Drums, Tread, A11.
Dryers, A35, B31, D15, H27, S31, S55.
Dryers, Fabric, C51, D15, T19, T43.
Dryers, Rubber, D15.
Dryers, Vacuum, D15, S55.
Dynamometers, S19.

Engines, Steam, S31.
Engraving Machines, Hard Rubber, A11.
Experimental Outfits, A11, B3, D15, D19, E11, F3, T43.
Extractors, E11.

Fittings, Hydraulic, A11, B23.
Fittings, Water, A11.
Folders, Belt, F3.
Forms, Dipping, D19.

Gages, Pressure, B23, S7.
Gages, Recording, S7.
Gages, Thickness, H11.
Gears, A11, F3, M23, T43.
Governors, Pump, M15.
Grinders, A11, F3, S47, T43.
Grinders, Hard Rubber Dust, A3 A11, F3, R3, T43.

Hammers, Steam, B31.
Hangars, D27, M27.
Hoists, D27.
Holders, Form, O3.
Hooks, Tire, D27.
Hose Machines, F3, R27.
Hydraulic Machinery, A11, B23, F3, H19, T43, W31.
Hydrometers, T7, T27.
Ice Machines and Equipment, D27.
Impregnators, B31, D15, F3, S55.
Instruments, Recording, S7, S19.
Insulating Machines, R27.

Joints, Expansion, A11, B23.
Kettles, A11, B31, D7, D15, S31, S55.
Knives, H31, J7, R7, T43.
Knives, Calender, R7.
Knives, Jar Ring, R7.
Knives, Mill, R7.
Knives, Tapping, R7.
Laboratory Apparatus, D7, D15, E11, F3, R27, S15, S19, T27.
Ladders, Rolling, M27.
Lathes, Hard Rubber, A11, S47.
Lathes, Jar Ring, A11, T31, W23.
Lathes, Wrapping, A11.
Lockers, O3.
Looms, Hose, R27.

Magnets, D23.
Mandrels, A11.
Markers, Shoe, H11.
Microscopes, E11, T27.
Mills, Grinding, A3, A11, E11, F3, R3, D7, T43.
Mills, Mixing, A11, D7, F3, T43, W7.
Mills, Paint, D7, R3.
Mills, Washing, A11, F3, T43, W7.
Mixers, Solution, D7, W7.
Molds, Hose, A11.
Molds, Mechanical, A11, D19, H11, H19, M3, T15, J3, D19.
Molds, Sole and Heel, D19, J3, D19.
Molds, Sundries, D19, H11, J3, D19.
Molds, Syringe Bag, D19, J3, D19.
Molds, Tire, A11, B3, T31, J3, D19.
Molds, Toy, D19, J3, D19.
Molds, Water Bottle, D19, J3, D19.
Motors, D27, E11, T43.

Name Plates, H11.

Pattern Making, A11, M3, T43.
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Scales, B7, D27.
Screens, D7, O3.
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Separators, Air, R3.
Separators, Magnetic, D23.
Separators, Water, A35.
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Shears, Power, F3.
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Wheels, Roller Bearing, D27.
Wire Drawing Machines, T43.
Wiring Machine, Hose, A11.
Wrapping Machines, A11, T15, T31.

Manufacturers of Rubber Factory Equipment

THE RUBBER AGE AND TIRE NEWS will gladly supply information regarding the addresses and products of the following manufacturers of Rubber Factory Equipment.
The advertisements of concerns whose names appear in bold face type will be found in this issue of THE RUBBER AGE AND TIRE NEWS.

A 3—Abbe Engineering Co.
A 7—Adams, John J.
A 11—Adamson Machine Co.
A 15—Adamson Mfg. Co.
A 19—Air Utilities Co., Inc.
A 23—Akron Rubber Mold & Machine Co.
A 27—Allen Machinery Co.
A 31—Alvey-Ferguson Co.
A 35—American Process Co.
A 39—American Rotary Valve Co.
A 43—American Tool & Machine Co.
A 47—Arthur Vulvanizing Machine Co.
B 3—Banner Machinery Co.
B 7—Becker, Christian, Inc.
B 11—Biggs Boiler Works Co. See Advertisement on Page 32.
B 15—Birmingham Iron Foundry.
B 19—Bonnett Co.
B 23—Boomer and Boschert Press Co. See Advertisement on Page 39.
B 27—Bristol Co.
B 31—Buffalo Foundry & Machine Co.
C 3—Cameron Machine Co.
C 7—Cell Drier Machine Co.
C 11—Champion Shoe Machine Co.
C 15—Chernack Mfg. Co.
C 19—Chicago Mold & Machinery Co.
C 23—Edred W. Clark.
C 27—Colonial Sign & Insulator Co.
C 31—Continental Rubber Works.
C 35—Cox, Geo. P., Last Co.
C 39—Crane Co.
C 43—Curtis & Marble Machine Co.
C 47—Cutler-Hammer Clutch Co.
C 51—Cutter, G. A., Sales Agent.
C 55—Cylinder Mfg. Co.
D 3—Davis, G. M., Regulator Co.
D 7—Day, J. H., Co.
D 11—De Mattia Bros.
D 15—Devine, J. P., Co.
D 19—Die Sinking & Machine Co. See Advertisement on Page 39.
D 23—Dings Magnetic Separator Co.
D 27—Duncan, J., Co. See Advertisement on Page 32.
E 3—Eastman Machine Co.
E 7—Eggers, William, & Sons.
E 11—Elmer & Amend.
E 15—Esterline Co.
F 3—Farrel Foundry & Machine Co.
F 7—Ford Chain Block & Mfg. Co.
G 3—Gammeter, W. F. See Advertisement on Page 37.
G 7—Garvin Machine Co.
G 11—General Electric Co.
G 15—Goodnow, L. H., Foundry Co.
H 3—Hartford Special Machinery Co.
H 7—Haywood Tire & Equipment Co.
H 11—Hoggson & Pettis Mfg. Co. See Advertisement on Page 35.
H 15—Hollander & Johnson.
H 19—Holmes Bros.
H 23—Housatonic Machine & Tool Co.
H 27—Hunter Dry Kiln Co. See Advertisement on Page 35.
H 31—Hyde Manufacturing Co. See Advertisement on Page 35.
J 3—Jones & Kuhlke. See Advertisement on Page 37.
J 7—Judson Cutlery Co.
K 3—Knott, L. E., Apparatus Co.
K 7—Kohl Mfg. Co.
L 3—Lander Last Co.
L 7—Landis Machine Co.
L 11—Lenz & Naumann.
L 15—Link Belt Co.
L 19—Lloyd, John, Co.
L 23—Lobdell Car Wheel Co.
M 3—McFarland Foundry & Machine Co.

Manufacturers of Rubber Factory Equipment—Continued

M 7—McGrory, Philip.
M 11—Mahlow & Wykoff.
M 15—Mason Regulator Co.
M 19—Miller, Chas. E.
M 23—Morse Chain Co.
M 27—Myers, F. E., & Bro.
N 3—New England Butt Co.
N 7—Norton, M., & Co.
O 3—Ornamental Iron Works Co.
O 7—Osborn Mfg. Co.
P 3—Pierce Wrapping Machine Co.
R 3—Raymond Bros., Impact Pulverizer Co.
R 7—Richard Co., Inc., Stephen.
R 11—Riehle Bros., Testing Machine Co.
R 19—Ross, Charles, & Son Co.
R 23—Rossman, Roy G.
R 27—Royle, John, & Son.
S 3—Sargent, E. E., & Co.
S 7—Schaefer & Budenberg Mfg. Co.
S 11—Schuchardt & Schutte.
S 15—Scientific Materials Co.
S 19—Scott, Henry L., & Co.
S 23—Sessions, J. H., & Sons.
S 27—Shaler, G. A.
S 31—Shartle Machine Co.
S 35—Shoe Hardware Co.
S 39—Singer Sewing Machine Co.
S 43—Smith-Backmann Machine Co.
S 47—Smith Co., James M.
S 51—Southwark Foundry & Machine Co.
S 55—Stokes, F. J., Machine Co.
S 59—Summit China Co.
T 3—Tagliabue Mfg. Co.
T 7—Taylor Instrument Co.
T 11—Taylor, Stiles & Co.
T 15—Terkelsen & Wennberg.
T 19—Textile Finishing Machine Co. See Advertisement on Page 39.
T 23—Textile Machine Co.
T 27—Thomas Co., Arthur H.
T 31—Thropp's, John E., Sons Co.
T 35—Trefethen, F. L.
T 39—Troemner, Henry.
T 43—Turner, Vaughn & Taylor Co. See Advertisement on Page 40.
U 3—Utility Mfg. Co.
V 3—Venn, Frank.
W 7—Werner & Pfleiderer Co.
W 11—Westinghouse Electric Mfg. Co.
W 15—Williams Foundry & Machine Co.
W 19—Williams Patent Crusher & Pulverizer Co.
W 23—Wills, Arthur J.
W 27—Wolff Co.
W 31—Wood, R. D., & Co.
W 35—Work, Joseph W.

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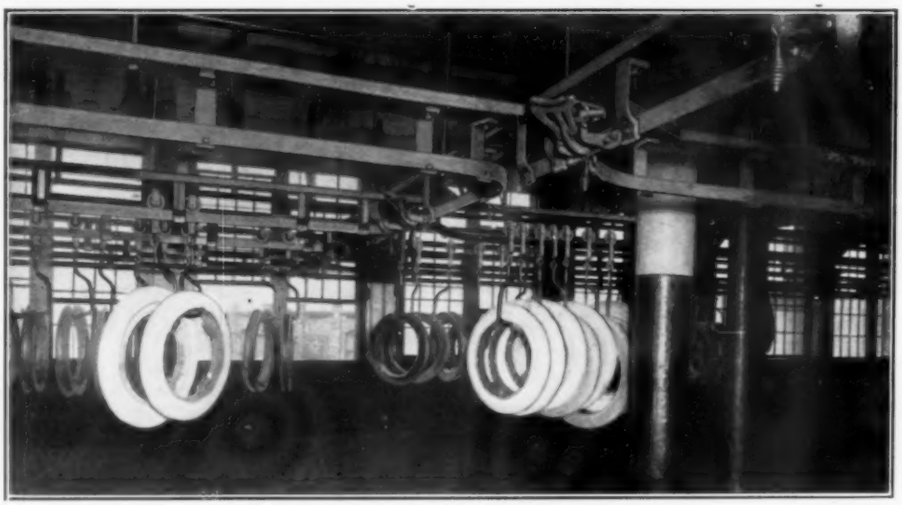

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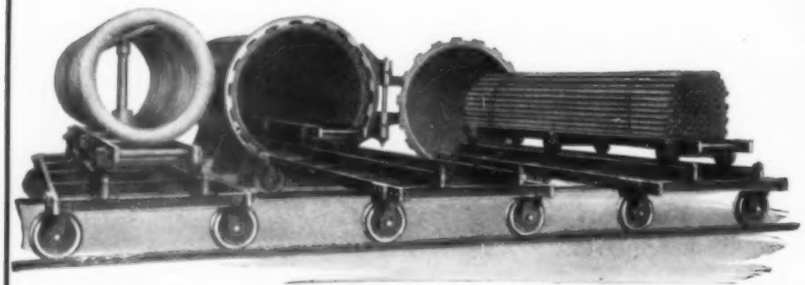

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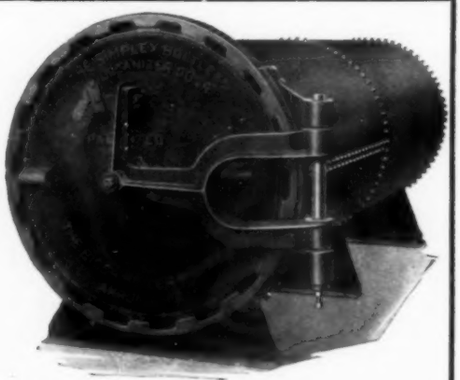

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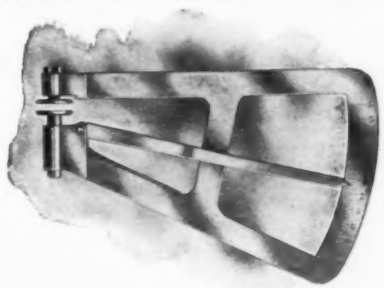

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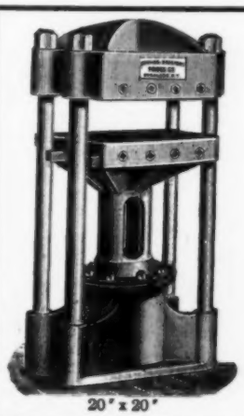

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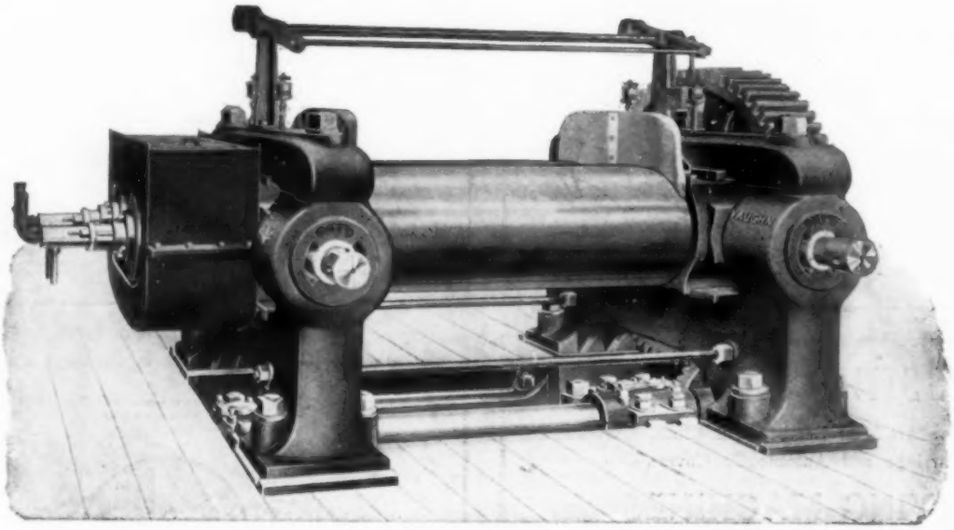

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